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No. 4.

Starting a Bramble Plantation

By George M. Darrow
United States Bureau of Plant Industry

THE PERFORMANCE of a bramble plantation throughout its life is determined to a large extent by the kind of care given the plants during their planting and early growth. If a plantation is started off with a healthy vigorous growth, it is pretty likely to be profitable throughout its life. On the other hand, if a plantation is started improperly, a weak growth commonly results, and the plants may be slow in recovering from these early unfavorable conditions, or they may not recover at all.

Double Profits by Obtaining the Best Grade of Plants

In the first place, great care should be taken in choosing the plants for setting, as healthy vigorous stock is essential for good crop yields. By taking care in the selection of his planting stock of black raspberries, one man in Connecticut secures higher yields from a year old plantation than most other growers ever get. This means that he is not compelled to wait two or three years before getting returns from his investment. He sets a new plantation each spring, using only the best tips from plants set the previous year (called creepers), and as the best cultural methods are used, these tips are far superior.

Ordinarily a grower may secure a yield of 2000 quarts of black raspberries per acre from mature plantings, but this grower has exceeded 4000 quarts from a year old plantation. All other brambles that propagate by rooting at the tips—the dewberries, Oregon Evergreen (Black Diamond) and Himalaya blackberries and the Logan—respond as does the black raspberry to selection of the strongest tip plants. Red raspberries and the other blackberries are propagated by suckers and root cuttings. With these, the response to the use of the best grade of plants will not usually be as great as with the brambles rooting at the tips, but selection of strong plants will pay exceedingly well.

Disease-Free Stock

Set disease-free stock only. This means, in the case of the dewberry, tip plants with no trace of anthracnose on the piece of the attached cane or root-cutting plants and with no crown gall on the roots; in the case of the blackberry, plants with no crown gall on the roots, and if sucker plants, those free from orange rust; in the case of the red raspberry stock free from crown gall on the roots and certified as hav-

ing not over two per cent of mosaic-affected plants when the diseased plants are rogued the previous summer; in the case of the black raspberry, tip plants with no trace of anthracnose on the piece of attached cane, and certified as having not over two per cent of mosaics when rogued the previous summer.

During the past few years and for some years to come, the planting of disease-free stock has been, is and will be the most important single item in bramble fruit growing in most of the United States. A few years ago, for example, when the writer secured several thousand Cuthbert raspberry plants, a small number of

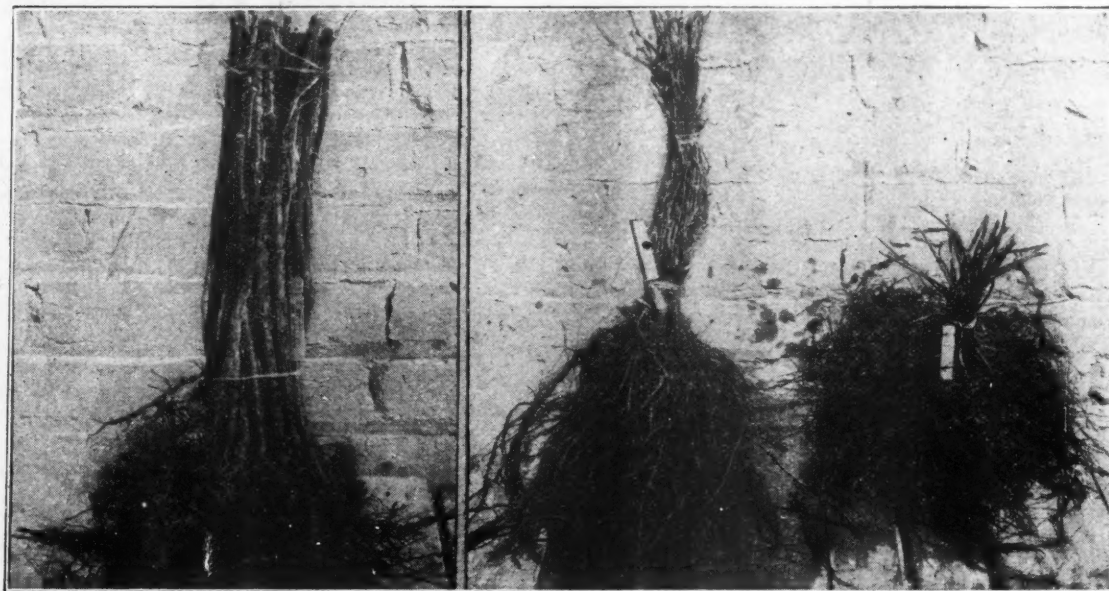
plants with crown gall (about five per cent) was found among them. These were carefully sorted out and the remainder planted. However, all were probably diseased, because a year later (when dug) 95 per cent were found affected, and the plantation was destroyed as worthless. In 1925, fields of Cuthbert raspberries containing many acres were visited, which, due to this disease, were not yielding over one-fourth the amount they should. On other varieties of red raspberries it is equally destructive, and on black raspberries and blackberries it is often the cause of unprofitable plantations. With the possible exception of northern New York and New England, the stock should not be planted when as much as five per cent of the plants are affected with crown gall.

The virus or mosaic diseases are fully as serious as crown gall because they are less readily recognized. These affect the red and black raspberries most severely, but also the blackberry and dewberry to some extent. Apparently because of this disease alone, whole regions have given up raspberry growing. However, several states are developing sources of certified stock which has been inspected and rogued during the growing season. Where the inspection has been properly done, only small amounts of affected plants will be found by growers. All growers should plan, as a regular practice in raspberry growing hereafter, to rogue their fields each spring about a month after growth starts. Only by such means can mosaic diseases be kept down. Growers must, therefore, learn to recognize the first faint traces of these diseases. Orange rust disease in the blackberry and black raspberry should be rogued out of the young plantation within the first month after growth starts. If this is done and if the plantation is gone over each spring thereafter, even the most susceptible varieties may be grown successfully.

Plant Standard Thoroughly Tested Varieties

In general, only standard varieties of brambles should be planted. Of the blackberries, the Eldorado, Early Harvest, Snyder, Lawton, McDonald, Oregon, Evergreen and Himalaya are standard for the various sections. Certain new sorts for various sections were suggested in the AMERICAN FRUIT GROWER MAGAZINE for

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Left.—A bundle of red raspberry plants as received from the nursery. The tops of such plants should be cut back to four to six inches above the "leader" buds to insure the growth of new canes from these buds. Center.—A bundle of 25 Lucretia dewberry plants grown from root cuttings, as received from the nursery. The tops of such plants should be cut back to four to six inches above the roots at planting time. Right.—A bundle of 25 Lucretia dewberry plants grown from tips

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Strawberry Growing at Bowling Green

By W. W. Magill
University of Kentucky

COMMERCIAL strawberry production around Bowling Green, Ky., started with a few acres planted in 1906. The first carload was shipped in 1907. Since that time production has varied considerably, reaching its peak of about 800 carloads in 1921. Approximately 200 carloads were sold in 1925. The estimated tonnage for 1926 is 250 cars.

Since central Kentucky was settled, dark tobacco has been the one big cash crop. The growing of this crop has resulted in an unbalanced crop system, and a new crop, which would not conflict directly with tobacco, has been in demand. The strawberry has filled this need at Bowling Green.

The standard variety for all commercial strawberry planting is the Aroma. This variety will grow well on all types of soil, including heavy clay, loam and sandy clay.

Rotation and Fertilization

Experienced growers prefer to follow a tobacco crop with strawberries. Where new land is accessible the first two years after clearing, tobacco is planted. This crop is naturally given very clean cultivation, which in turn reduces the damage from weeds and grasses. Rye is planted as soon as the tobacco is cut in the fall and allowed to stand until early spring. Then it is turned and the land is prepared for setting the strawberries. The berries occupy the land for two to four years, usually three years.

No definite practice is followed in regard to the use of fertilizer. When planting on new land following tobacco, many growers use little or no commercial fertilizer. On the other hand, when berries are planted on old land, 400 pounds per acre of acid phosphate or a 2-12-2 mixed fertilizer applied after plowing makes a difference in yield of 20 to 40 crates per acre. This is either applied broadcast or distributed with a fertilizer drill when the plants are set.

Time and Method of Planting

The planting season is during late March or early April, or as early in the spring as the soil can be put in condition. The land is worked up in

both directions, and the plants are usually set three and one-half by two and one-half feet, this distance requiring about 5000 plants per acre.

Cultural Methods and Yields

Growers who cultivate most thoroughly get the largest yields. Eight cultivations with one-horse tools and two or three hoeings are considered advisable and profitable. This work is started in early spring soon after the plants are set and is continued until late in the season. Few rains fell during June, July and August of 1925, and the berry growers who continued cultivation in spite of the drought now have a fine prospect for a crop the coming season.

Yields throughout the section in 1925 varied from 20 crates to 300

crates per acre, the yield varying in direct proportion to the care given the plants.

As soon as a crop of berries is harvested, the field is "worked out;" that is, by means of a one-horse turn plow, the matted row, which is usually about 12 to 15 inches wide, is plowed on both sides, leaving a row of new plants about six inches wide at the side of the old row. They are then cross-cultivated, using a double shovel plow. Cultivation and hoeing are then continued as during the first year.

Marketing

All berries produced are sold through co-operative marketing associations. Until about 1922 one association handled all the berries from the section, but since that time var-

ious agencies have been responsible for dissatisfaction, resulting in four small associations now being in existence.

This condition of marketing is indirectly responsible for the decreased production for the last few years. An effort is being made by the various association managers and the leading farmers of the section to federate or unite the present four associations into one big organization.

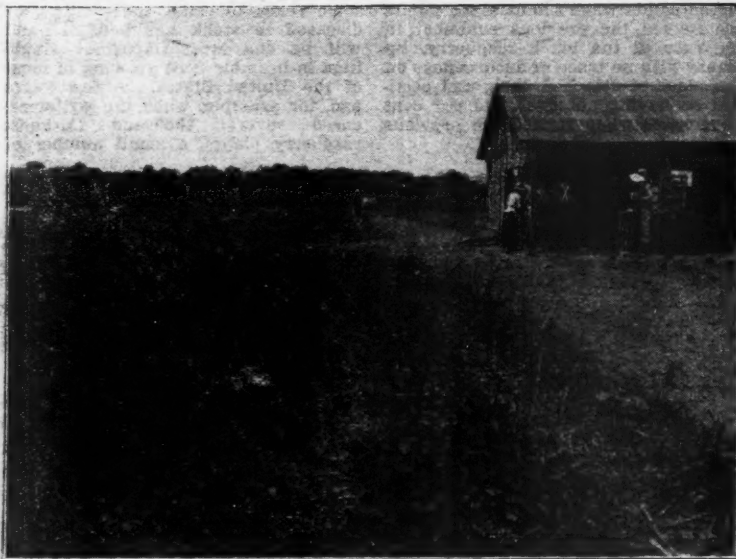
Outlook for the Future

Berry production as a cash proposition in the Bowling Green district has established itself as a farm practice. Growers are very optimistic about the outlook for the future. Ten years ago there was keen rivalry among the growers to see who could cultivate the largest acreage. One farm cultivated over 100 acres per year for several years. Since that time many tenant families have left the farms, making cheap labor scarce. Instead of the large acreages, three to six-acre patches are increasing in number. Usually, growers with a small acreage get larger returns per acre than growers with a large acreage, and after all expenses are paid their net returns are also larger.

Not only is Warren county, the home of Bowling Green, interested in producing berries, but the industry has spread into Simpson, Allen and Logan counties as well.

On farms which are well managed an average yield of 75 24-quart crates per acre year after year is a very reasonable estimate or possibility in production. If the berries are marketed co-operatively, there is little fear of the prices f. o. b. loading point falling below \$2.50 per crate for several years.

The strawberry crop has excellent possibilities in many areas in western Kentucky if undertaken on a small scale. There must be adequate transportation facilities. There must be co-operative efforts. One grower cannot market his crop alone. The crop should be well cultivated. The harvesting season should be carefully planned for. But these things when done wisely are usually rewarded by good returns.



A strawberry plantation and packing shed near Bowling Green, Ky.

Problems in Peach Growing

By J. L. Baskin
Tennessee Horticultural Society

INSECTS and diseases take their toll in the peach orchard every year, but growers have come to know their habits or life cycles and are now able to cope with them successfully. In many orchards the toll from these two maladies is less than five per cent. The alert peach grower of today can insure his orchard against these ravages by following certain well-known practices which will exterminate them or reduce them to where they are not a serious factor. However, the expense of combating these pests may so materially increase the cost of production that the margin of profit is very narrow. Nevertheless, such pests are largely within the control of man.

Probably the greatest underlying factor that determines success or failure in the peach orchard is weather. As one farmer ironically remarked, "There has been more said about the weather and less done about it than any other thing that affects agriculture or the well being of man." This will always be true.

In most areas east of the Mississippi River, where peaches are grown commercially, the weather continues to be the major hazard. Regularity of crops is essential to the well being of the commercial peach grower. Unless growers can secure crops fairly regularly (three out of four or four out of five or not less than three out of five years), peach growing will very likely be a failure. Of course, where one has an extremely low operating cost and a strong market, he may be able to operate at a profit and obtain a crop

only every other year. When a crop is produced every other year, fruit is likely to be quite plentiful in the years when a crop is borne, and, therefore, low priced. This hit and miss proposition is often traceable to irregular care, which further reduces the quality of the fruit during heavy crop years. During the off year insects and diseases breed up and get a start, the pruning and fertilizing are neglected, and the trees produce so heavily that the size and quality are small. The hub of success in commercial peach production is regular crops.

The failure of orchards can very frequently be traced directly to one or more crop failures, followed by insects and diseases, which follow in the path of neglect.

Misconceptions

Many people become interested in fruit growing as a result of glowing stories related by nurserymen or real estate promoters. Such people have a right to sell their wares to prospective customers so long as they do not misrepresent the facts. Many people are looking for some scheme to get rich quick, and such people are easy prey for promoters of colonization, real estate operators or salesmen of nursery stock. Fruit growing does offer good returns on the investment, but in most cases it is a rather long

time investment; especially is this true of tree fruits. Many have planted orchards of such proportions that they do not have sufficient capital with which to operate until the trees come into bearing. What man would be interested in bonds that would pay no interest for six to eight years? When one invests in an apple orchard, he will not only fail to draw dividends for six to eight years, but he will find it necessary to furnish operating capital in addition for this period of time. These slow returns are discouraging, and this explains why so few individuals or companies own an orchard that they themselves planted. Of course, there are many conservative orchardists who have planted their own orchards and brought them into fruiting and are now reaping a harvest. On the other hand, many orchards now in bearing have been sold several times while in the process of coming into bearing.

False Economy

Very few orchards receive the proper amount of attention while they are coming into bearing. The developer is anxious to bring them into bearing as cheaply as possible. Very frequently excessive economy is practiced and damage results which permanently affects the full development and fruitfulness of the orchard. After the orchards come into bearing,

quite a few growers fail to purchase adequate equipment to properly spray on time. After crops are made, growers lose money by using expensive hand labor to do the grading. Of course, such a practice is necessary unless the volume is large. Nevertheless, it is expensive.

What is the greatest financial factor in developing an orchard? The price of real estate is thought by many to be the greatest financial factor in developing and operating an orchard. It is the greatest immediate outlay, but once the land is paid for, that part of the expense is ended except for the annual taxes. Buildings are expensive to construct, and when we consider sufficient tenant houses, barns, tool sheds and storage houses, we must admit that these, too, are expensive, and so is the purchase of equipment and livestock. When we consider the entire life of the orchard and its cost of operation, however, we find that labor is the ever present and greatest item of expense.

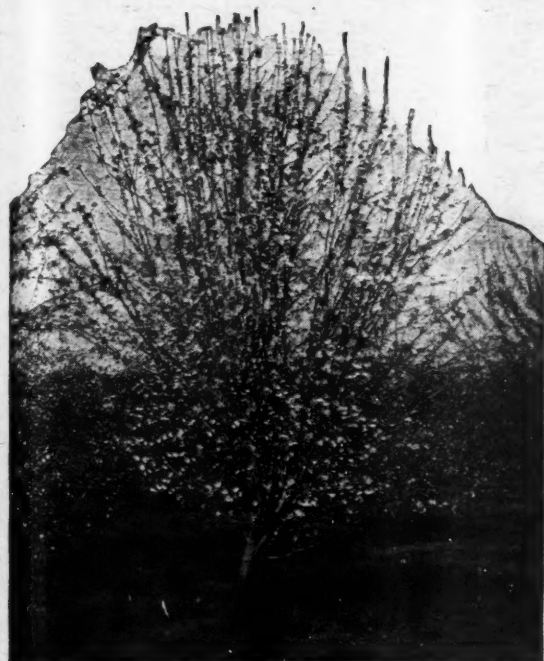
Factors That Tend to Reduce Cost

Make every tree produce its full share. This can be done by stopping erosions that are impoverishing the soil. Remove over-shadowing hedge rows or wood edges. Secure a full stand of trees. Substitute horsepower for man power where feasible. Build the packing shed in a central location and handle fruit as little as possible. Buy your spray materials and orchard supplies in carlot quantities. If you are not operating on a

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Ringing of Filler Apple Trees

By J. H. Gourley
Ohio Experiment Station



Ringing induced Livland trees to produce enough bloom for a crop

"NOW THERE is that large block of 11-year-old Baldwin and Stayman trees," an orchardist said. "Those Baldwins have scarcely had a blossom yet and I rather think I will take them out, leaving the Staymans as permanents. What can be done to make them profitable before they are removed?"

Some such experience as the one above cited opens up a problem that is common but by no means rare. This matter of tardy bearing of fruit trees is one of the most exasperating experiences of the fruit grower. It is something like the temporary experience of a mountain climber who finds the journey longer than he had expected but who has no way of knowing how far he must yet go before reaching the top. He not only becomes aggravated, but he feels a sense of helplessness in the situation. So the orchardist feels that he has done everything consistent with good management, and he is disappointed with the outcome. He does not know how much longer he must wait. In these special orchard problems, is there any practice or device that can be followed to give seriously needed relief? It is not a matter of debating some academic problem, but rather a pressing one to be solved, or, as has been said, "we face a condition, not a theory."

It is not strange, then, that such an ancient and discarded practice as ringing or girdling should be called into play and another serious effort made to determine whether or not it could be applied to commercial orcharding under these rather exceptional circumstances. If a wholesale lot of trees is to be removed before profitable crops have been secured, then not much is to be lost if a trial of the practice proves either impotent or hurtful. So it is with some such background in mind that an effort has been made in Ohio to determine the practicability of ringing "filler" apple trees which for some reason are slow in bearing.

Causes of Unfruitfulness

Barrenness of fruit trees is a complex problem. Some of the causes of it seem clear, while others are only vaguely understood or entirely in the realm of the unknown. Some of the reasons commonly assigned are: immaturity of the tree; variety; undernourishment or lack of vigor so that fruit buds do not form or else the blossoms fall at "the first drop;" frost at or near blossom time; lack of proper pollination; undesirable

stock on which the scions or buds were worked; and sterility due to hybridity. With the exact cause of barrenness we are not so particularly concerned in this paper, but we are concerned with the remedy. Ringing is used only when trees do not produce fruit buds. It has no helpful influence in causing fruits to set if the tree is already producing blossoms.

A Variety Problem

Although cases can probably be cited to the contrary, the chief factor involved in the tardy bearing of well-cared-for, thrifty trees in a young orchard is that of variety, together with the

recognized premise that the trees are relatively young. It is variety primarily and not an over-vegetative condition. Under the same good cultural conditions that bring the more precocious varieties into full bearing,

their blossoms, but only with non-bloomers.

Furthermore, it should be said that soils and other conditions may make a difference of several years in the maturity of a given variety. Also orchardists are sometimes misinformed or wrongly advised as to the probable age at which a variety will attain bearing, and this often contributes materially to the restlessness.

The Ringing Operation

Different methods are used to sever the bark tissues and no one seems to be generally accepted as the best. In the experiments conducted by the Ohio station a ring of bark about a quarter of an inch or less in width is removed from completely around the limb or trunk by making two parallel cuts with a heavy pocket knife. Care is taken not to scar or scrape the exposed cambium cells or inner wood cylinder of the tree. As soon as the ring is removed, a protection is given the wound to prevent drying of the tissues and entrance of foreign matter or organisms. The tape used is cotton cloth strips, an inch and a half in width, that has been impregnated with grafting wax. Tire tape is also used, and in either case it is usually not necessary to use a tack to hold it in place, because of its adhesive nature. A covering of shellac also seems to be satisfactory.

Some growers make a saw mark about the tree to the depth of the bark.

The same results are secured and time is saved but the wound is somewhat lacerated so that organisms injurious to the tissue may find ready entrance unless the wound is protected. In most cases observed, however, the wound has healed satisfactorily, although we would not advise this method.

Incomplete work at this time indicates that success may be expected if a knife is simply drawn about the limb at one or more places so that all the bark tissue is severed in to the wood but without removing any bark. The wound can be sealed with shellac also.

Wires or bands have also been recommended but to date no results have been secured at any of the four places in the state, unless the wire is so fine as to completely cut the tissues to the cambium, which is practically the same operation as the above. So from our experience with them, they cannot be considered effective.

Prior to the ringing operation, and also the following spring, the trees should have an ample fertilizer application. If the fruit sets heavy, it should be thinned even more severely than is ordinarily done. These follow-up methods and precautions should not be overlooked.

The wounds resulting from the operation will usually heal quickly and the new tissue should be flush with the bark by mid-August. The most desirable type of healing is for the exposed cambial cells to renew the growth, but in case they fail to do this, a callous tissue develops and effects a satisfactory healing.

A report from one state has been received that blight entered the wound and also developed on the shoots that so frequently arise below the wound. Hence care should be used to protect and sterilize the wound in the more southern regions where blight is troublesome; or rather ringing should not be practiced until it has been demonstrated that it will cause no danger.

Portion of Tree to be Ringed

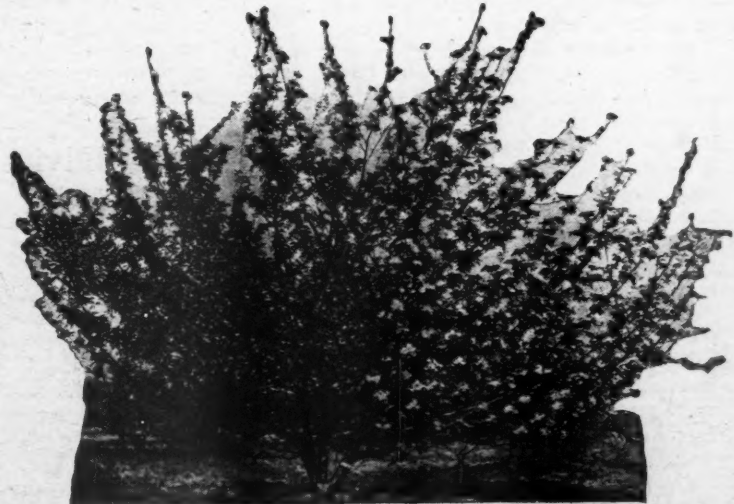
If the entire trunk is ringed, the influence will, of course, extend more or less equally throughout the branches of the tree and the maximum results would be secured. But the maximum chance of injury is also involved. Furthermore, it does not seem best to ring the tree in successive years, first because of uncertain results, and second because of a liability to stunt the tree in case excessive blossoming occurs year after year. It has been our practice, therefore, to ring one or two of the scaffold limbs one year, others the second, and if it is necessary, still others the third, finally coming back to the original ones if the tree has not yet come into bearing without this artificial stimulus.

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One side of a Baldwin in full bearing due to ringing of one scaffold limb. No blossoms developed elsewhere

the others may still be from 11 to 14 or even 15 years old before producing a commercial crop. It is then only a very few years until they must be removed to give the full space to the permanent trees. Allowance, of course, must be made for unreasonable expectations, for example, the heavy bearing of a five-year old Baldwin or Northern Spy tree, but usually this is not so with the commercial orchardist who reports such a problem as is here being considered. We have had no complaints of consequence regarding Jonathan, Grimes Golden, Stayman Wine-sap, Gano, McIntosh and many others; but such ones as Baldwin, Northern Spy, Red Delicious, Livland Raspberry, Yellow Bellflower, Esopus and others are frequently reported. Livland is the only one in this list that is likely to be used as a filler, but errors of judgment, mistakes at the nursery, or some other circumstance may result in some of the other varieties being used as fillers. Let us repeat again, we are not here concerned with trees that bloom and shed



Abundant blossoms on one limb due to ringing. Note position of wound near base of limb. Such limbs produced from one to three bushels of apples

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Use Only Sufficient Arsenic to Kill the Bugs

SEVERAL shopkeepers in London were fined a short time ago for selling American apples containing arsenic. The action resulted from a complaint by a health department that cases of sickness had been caused by such fruit. The Jonathan apples in question, it was shown, contained up to one one-hundredths gram of arsenic per pound of apples. English grown apples examined at the same time were reported to be free from arsenic.

The defense in the case pointed out that in America the codling moth makes it necessary to spray with arsenicals and that sometimes, as during the last season, dry weather late in the summer prevents much of the material from being washed off the fruit.

It appears that the question was not raised at the trial as to whether or not fruit sprayed with the amount of material that is ordinarily employed in spraying practice would result in any damage whatever to the health of people. In this country numerous tests have been made which show that no damage to health is likely from the use of apples sprayed with even the heaviest applications of arsenicals known in practice. No case of sickness attributed to the eating of apples sprayed with arsenicals has been reported in this country, so far as we know.

Some people have raised the question as to whether or not this matter may have been the result of British propaganda intended to encourage the use of fruit grown in Great Britain and its possessions. The British government, it will be remembered, is spending a considerable quantity of money in promoting the consumption of fruit, particularly English grown fruit, and it also plans to encourage a preference for English grown fruits through other means.

However that may be, American fruit growers should use only so much arsenic as is absolutely necessary in their spraying practice. Possibly the health tests which have been mentioned have caused some growers to become over-confident, and perhaps some of them have unknowingly used more arsenic in their spraying than they should have used. Possibly some growers, having failed to control the codling moth early in the season, have

used unduly large quantities later in the season in an effort to overcome the damage resulting from the early infestations. A certain amount of arsenic is required to control codling moth and other insects, but it does no good to apply heavier dosages than such amounts. To do so is both uneconomical and unwise from a market standpoint. Growers should use the amounts of arsenicals prescribed in standard spraying schedules, but they should use no more than that.

Repeal Weight Per Bushel Laws

PRACTICALLY every state of the Union has a system of weight per bushel laws. These were passed years ago when transportation was poorly developed and when commerce was almost entirely a local proposition. Furthermore, most of these laws were based on the heaped bushel.

Under the circumstances, it is natural that the weight per bushel laws should lack uniformity. For instance, the weight of a bushel of apples varies in different states from 44 to 50 pounds, that of cranberries from 32 to 40 pounds, that of grapes from 40 to 60 pounds, that of gooseberries from 40 to 48 pounds, that of peaches from 40 to 54 pounds, that of pears from 45 to 58 pounds, etc.

Even if the state laws were uniform, standardization of packages on the basis of the weight per bushel would be impracticable as applied to fruits and vegetables. The weight of fruits and vegetables varies with different varieties. A bushel of transparent apples, for instance, is lighter than a bushel of Wine-saps. A bushel of small apples or potatoes is lighter than a bushel of large ones, because of the greater air space. The same variety differs in weight when grown under different conditions.

Experts of the United States Department of Agriculture have been studying standardization of grades and packages very carefully. They have reached the conclusion that fruit and vegetable packages should be standardized on the basis of volume and dimensions and not on the basis of weight per bushel. This seems to be a logical and sensible viewpoint. The United States Container Act and the United States Barrel Act, now in force, are both framed on this principle, and further standardization laws are being proposed along the same line.

The weight per bushel laws are obsolete. They were passed under conditions entirely different from those existing now. They not only conflict with each other, but they conflict with the laws and rules of the United States government, and they are presenting some serious obstacles in the working out of a comprehensive and sensible system of standardization. The weight per bushel laws of the various states should be repealed insofar as they apply to fruits and vegetables. We recommend that our readers use their influence to bring about the repeal of these laws in their states.

Dividing the Fish

JOE PETERS and Bill Jones both had a serious attack of spring fever, and they decided that the only way to break it was to go fishing.

Said Joe to Bill, "You and I have always been about equally good at catching fish, so let's put our fish on the same stringer and divide them equally when we get home."

"All right," said Bill, "that sounds fair."

The two fishermen arrived early at the secret fishing place the next morning and the fishing was fine. For about an hour and a half they continued to pull out nice croppies and sunfish about as fast as they could bait their hooks. Then the fish stopped biting.

Bill got tired of the monotony, and, after asking Joe to look after his lines, he took a stroll through the woods nearby.

During his absence, Joe got to thinking. "We've got lots of fish," said he to himself, "and I have a bigger family than Bill, and he'll never miss 'em anyway, so I'll take a few fish off this stringer and put them in the bottom of my lunch basket." Accordingly, he removed eight nice specimens and secreted them in his lunch basket.

When Bill and Joe reached home, they divided the fish on the stringer. Both expressed satisfaction with the day's sport, although Bill did remark once that he thought they had caught more than they did.

This story may seem like a crude one, but the principles involved in it are no different from those being applied at the present time in a nation-wide way.

In our economic structure, we have the thing known as the "national income." It includes the combined earning power of land, labor and capital. It now amounts to about 66 billion dollars annually. It is not brought together in one place, but it exists in the country at large, nevertheless. This national income may very properly be likened to the stringer of fish. Obviously, it should be distributed among our various citizens according to the services rendered by each. But such is not the case.

Business, labor and industry are now largely organized by groups, and every little while the representatives of one of these groups run down to Washington, thinking that the rest of the population is not looking, and they get Congress to pass legislation which gives the members of their group certain advantages in the distribution of the national income. In other words, they get the government to give them legislation which will prevent the law of supply and demand from applying to them in full force and which will permit them to take a portion out of the national income before it is distributed, the same as Joe took eight fish off the stringer and secreted them in his lunch basket before the fish were divided.

Agriculture has been largely unorganized until recently, and it has been unable to take care of its interests. The advantages which other groups have obtained may each be small in themselves, but in the aggregate they amount to a great deal. Agriculture has been a powerful industry, and it could stand a lot of hard punishment. However, the advantages which other groups are getting at its expense are beginning to prove a tremendous burden; in fact, many farmers and fruit growers have gone under because they could not make ends meet, and others will follow.

Fortunately, fruit growers and farmers have been developing organizations in recent years. They have been studying the situation as it has never been studied before. They are now aiming their efforts at a fairer division of the national income, and in so doing they are for the first time striking at the fundamentals of the situation. They are gradually convincing political and business leaders that a real agricultural problem exists, and they are showing them where the trouble lies and how it may be corrected.

The problem needs correction both for the welfare of agriculture and for the welfare of the country in general. There is plenty of wealth in this country to make everybody comfortable. We believe most people are fundamentally fair-minded and want to see the national income distributed equitably. People are gradually being brought to understand the situation, and with understanding there will eventually come a solution. The question now seems to be largely one of developing methods of putting the principles into operation. We hope that the farm organizations will succeed in their efforts to bring about a fairer distribution of the national income.

Propagation of Fruit Plants

Part V.—Propagation of Stone Fruits

By W. H. Alderman

University of Minnesota

THE PROPAGATION of the drupe or stone fruits is one of the most interesting chapters in the propagation series. There are not only several groups of stone fruits differing from each other in many respects, but within these groups themselves are frequently found several species with radically different habits. Since many of the fruits may be propagated by budding or grafting on the roots of entirely distinct species, it gives the nurseryman a wide opportunity to select stock adapted to various needs. This point will be fully illustrated in some of the succeeding paragraphs.

Propagation of the Peach

The peach in America is propagated almost entirely by budding. Grafting may be practiced either as root grafting in the nursery cellar or as crown grafting in the field, but is much more laborious than budding and is far from being as uniformly successful. Since the peach is a rapidly growing plant and continues its growth until late in the fall, it is usually difficult to secure well developed buds suitable for budding until late in August. The peach forms flower buds on the one-year-old growth as well as leaf buds, and bud wood selected from bearing trees very often carries flower buds along with each leaf bud. Such buds can be used but are not as desirable as the leaf bud alone. Buds cut from young orchard trees or nursery trees rarely contain flower buds.

Peaches are almost universally propagated on peach seedling stock, although various substitutes can be used. Probably the best seedling stocks are grown from what are known as southern pits. These are collected from peach trees that have escaped to the wild and which grow abundantly in certain sections of Kentucky, Tennessee and the Carolinas. Such pits are uniform in size, smaller than the general run of canning factory stock, and are generally supposed to produce a very uniform group of seedlings that are free from peach yellows or little peach diseases. It is quite possible, in fact even likely,

that certain cultivated varieties of peaches might produce better seedlings than those grown from these wild pits. No work, however, has been done thus far toward selecting such desirable seedlings.

Among the numerous substitutes for peach seedlings is a fruit known as *Prunus Davidiana*, a kind of peach imported from North China. The fruit of this species is of little value as a food product, but the plant is harder than the ordinary peach and makes excellent stock for the peach. It is difficult to fruit in our northern climate because of its habit of starting growth in the fruit buds during the first warm spell of winter and subsequently losing these buds by freezing. It will be necessary to grow the fruit in mild climates if pits are to be secured in abundance. In some sections it has been a quite common practice to propagate the peach on plum roots, frequently by root grafting. Such nursery stock is generally supposed to be a little better adapted to heavy soils than when propagated on peach roots. Various plum stocks have been used, including Myrobalan, St. Julien, sandcherry (*Prunus besseyi*) and the native *Prunus Americana*. Of these the Myrobalan seems to be the least desirable. The sandcherry makes an excellent stock and somewhat dwarfs the vigorously growing peach. As might be expected, the hard-shelled almond also makes a good stock for the peach.

The seeds of these various fruits are all propagated in much the same way, the pits being collected in the fall, stratified during the winter, sifted from the sand in the spring, and planted in nursery rows about four feet apart. Peach pits will usually separate readily after such stratification and allow the kernel to be readily re-

moved. The peach seedling will make a sufficient growth the first season to allow budding in August of the same year it is planted. The several plums will generally do nearly as well, although occasionally it is necessary to hold them until the second year before they are large enough for satisfactory budding.

Propagation of the Nectarine

This delicious fruit is very similar to a peach and can be separated from the peaches only through the fact that it is smooth skinned like a plum. Since the trees are identical with peach trees, or nearly so, it is only reasonable to expect that they can be propagated in the same manner as peaches, using the same stocks. They are generally budded on peach stock, but can readily be propagated on many other stocks, such as plum and nectarine seedlings.

Propagation of the Plum

The cultivated plum contains more species than any other of our common fruits. In America we commonly grow several species of our native American plums and three or more of Old World fruits, including both Asiatic and European species. Plant breeders have hybridized a number of these species, giving us still further diversity of varieties. As might be expected, this situation has led to a considerable divergence in the stock used for propagation. The most common stock is the imported Myrobalan plum seedlings. Among eastern nurseries, at least, the Myrobalan is at present used almost to the exclusion of other plum roots. Plum stock of the Damson type, known as St. Julien, was formerly used abundantly, but is now giving way to the more easily budded Myrobalan. Among the na-

tive plums we find the Americana used more extensively than any other. For the upper Mississippi Valley and other northern districts the Americana, because of its hardiness, is widely used, both the Myrobalan and the St. Julien being too tender to stand the climate of the northern prairie states. The Canadian plum, *Prunus Nigra*, is another excellent source of stock, although not as commonly used as the Americana. The sandcherry is used to some extent, but because of its dwarfing habit, it is not quite as popular with nurserymen as the larger free-growing species. In the South it is very common to find the plum propagated on peach roots. This is supposed to be an advantage in sandy soils. Because of their vigorous growth they make excellent nursery trees. They, of course, are not suitable for the northern states. In some districts both the hard-shelled almond and the apricot are used in a limited way as stock for plums.

The seedlings from these various stock sources are handled in the same way as outlined for peaches, namely, gathered in the fall and stratified and planted in the spring in nursery rows. Since most of these are somewhat slower growing than peach stocks, they are generally not budded until the second year, being dug at the end of the first year and replanted the following spring. This transplanting gives a better distribution of seedlings in the nursery row and is supposed to assist in the development of a more satisfactory and compact root system. In some sections, if a favorable growth has been secured, they are budded during the first season after planting.

Reference has been made to the budding of plums, and this is the general practice. It is possible, however, to practice root grafting during the winter and early spring with considerable success. In fact, some nurseries in the northern states grow a large number of plums in this fashion each year, partly to utilize their skilled labor

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Stop the Gullies

By G. E. Fager

County Agent, Union County, Illinois

COMMERCIAL orchards are planted, to a large extent, upon land which is more or less rolling, often hilly and broken. At least, it is the intention to locate the orchard on land of comparatively high altitude in order to secure adequate air drainage. Land of this type is likely to be more or less rough and broken.

Whenever slopes or hills of any considerable degree of steepness are cultivated, the old time problem of "soil washing" enters in. It is a pretty generally accepted opinion that young orchards, and especially young peach orchards, require more or less cultivation so that a satisfactory growth will be made. Consequently, this working of the rolling ground results in increased losses due to erosion, either by the formation of gullies or by sheet erosion. Many orchards planted on hillsides are often neglected simply because the owner has found it extremely difficult to till the soil and still "hold" it, and the lack of proper cultivation results in poor growth, which soon discourages the orchardist. Again, many slopes which would without doubt make excellent orchard sites are practically waste land due to erosion or to being allowed to grow up to weeds, and are rapidly going into the discard as profitable farm land.

Erosion Causes Loss of Soil Fertility

In addition to the problems of tillage as concerns the actual mechanical holding of the soil, one must also consider the loss of soil fertility due to erosion. Maintaining soil fertility is one of the first requirements of a system of permanent agriculture, and

few farmers realize the enormous loss of soil fertility due to erosion. This loss may be due to the formation of gullies or to sheet erosion. Sheet erosion, while not so noticeable as gullying, is the source of much loss of fertility because it is this type of washing that removes the rich top soil

and carries it away to be deposited elsewhere.

The amount of erosion is dependent upon the speed and the amount of water running off. Therefore, in order to stop or lessen the losses, the logical scheme would be to develop some method of retarding the flow of run-



This picture shows how soil washing occurs when the land is not properly handled. Such conditions can be avoided by terracing

off water, both as to speed and quantity. This has led to the development of the Mangum Terrace.

Many farmers in hilly and rolling territory are beginning to see the need of some method of "holding" their soil and are turning to the use of the Mangum Terrace as a practical method. Several men have been interested to the extent of constructing terraces, and others, having seen the good results, are falling in line. It is possible to terrace a slope after it has been planted to trees, but the operation is much more simple if the terracing is done first and the trees planted later. Besides terracing slopes for planting to orchard, many other crops may be grown on terraced land which otherwise would have to remain in sod or be converted into wood land.

Sloping Land Should be Terraced

Land which has a fall of three to 15 feet per 100 feet can be terraced and cultivated. If the slope is much greater than this, however, it is probably best to keep the terraces in sod for pasture or in hay crops.

The terrace itself is merely a ridge of dirt built up and running across the side of the slope according to a definite grade. The terrace has a broad base and comparatively flat sides. Under conditions in Illinois the terrace grade varies from four to six inches per 100 feet. The fall between terraces varies from about three feet for land having a slope of three feet per 100 to about seven feet for slopes as steep as 12 feet per 100 feet. The object of each terrace

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Fig Culture in San Joaquin Valley

By William Reynolds Butler

FROM the torrid Imperial Valley of California north as far as the Thermal Belt in Butte county, the latter being in the same latitude as Baltimore, the fig can be found either as a border or roadside planting or as an ornamental tree. But in the San Joaquin Valley, all points considered, it has found the most optimum environment of any place in California. Experts connected with the United States Department of Agriculture state that conditions in the San Joaquin Valley are almost identical with those of the fig-growing localities of the Old World. Anent the fig industry, which, until recently, was listed in the state's crop reports in the "other fruits" column, the California Department of Agriculture report for 1920 had the following trite remarks to make: "The fig industry of the state has a wonderful outlook for the future. Everything indicates that the California fig will reach a point of quality within a few years never before attained in the history of the industry."

Organization Has Meant a Great Deal to the Industry

The fig growers have been organized jointly with the dried peach producers for several years. The co-operative is known as the California Peach and Fig Growers' Association. With a membership of 8500 member and controlling the marketing of 75 per cent of the dried peach crop and about 80 per cent of the fig acreage, bearing and non-bearing, the alignment of the growers of a newer crop with an older, experienced growing and marketing organization has meant much to the industry. In a way, the growers of both fruits have mutual packing and marketing problems from the standpoint of dried products. A staff of specialists in orchard management, entomologists, pathologists, soil technologists, irrigation experts, advertising and publicity men, salesmen, market analysts, canning and processing experts have been active in the interests of the new organization. Before organizing, the whole California fig business was hit or miss and willy nilly. In the short time since an organized effort has been active, much has been accomplished to bring order out of chaos and put the industry on a sound basis.

The story of the rapid rise of this most promising new California fruit business is an interesting one to those interested in successful co-operative marketing, where an organization takes off on the right foot and watches its step. In order to make a first-hand study of the effect of this healthful co-operation, I have recently made a trip through the counties of Fresno, Tulare, Merced and Stanislaus, where the largest and oldest commercial plantings are to be found and where the largest packing and canning plants are located. E. M. Boland of the California Peach and Fig Growers' Association recited the accomplishments of their organization and acted as guide on visits to some of the successful growers and to the various packing houses and canneries.

"We have made it our business," said Boland, "to act as a clearing house for information on methods of growing the crop, harvesting, grading, packing and marketing. Our biggest problem, the same as other organizations of fruit growers, is to educate our growers to the value of quality. At the same time, the association has built two plants for the purpose of developing the canning and preserving of figs. In these canneries, as well as the other plants where fresh dried figs are handled, we set our grading and processing on a high-quality basis. Although we know that our dried fig products are the purest on the market and are outselling our competitors, we have decided that we do not want to sell California figs strictly by competitive methods, but we want to reach the consumer by

giving him figs in a new form and in a new and better way.

"The tonnage of California figs will be great in a few years, when the later large acreages come into bearing. Our efforts now are towards having the market ready for these figs when they come, and we must pro-

broken fruit, into fresh fig jam. Quite a trade has developed for the water-pack fig. In this form, it is shipped to other canneries to be utilized according to trade demands. Concerning this canning side of the industry, Boland says, "The association seeks only to use this plant as a demon-



Gyp corn is grown between the rows, the fodder from the corn being used to wrap young trees for protection from frost

duce these figs on both quality and quantity basis and market them at the greatest profit to the grower and still keep the price down to the point where the consumer can buy regularly and often."

Mr. Boland told me of the efforts of the growers to market fresh figs in eastern markets. For several years, individual growers in California have shipped fresh figs in shipments of grapes with varying success. In the summer of 1921, a shipment of precooled and refrigerated figs made the trip to New York and sold for a dollar a pound. All told, 12 cars were expressed east that summer at prices running from 70 to 90 cents a pound. A railroad strike then interfered with more shipments. This will open new markets for part of the crop of

stratification of newer methods of caring for the crop. As products are developed and demand created, we will turn the business over to commercial canners."

Our visit to the association's dry fig packing plant at Merced confirmed the claim that every effort was put forth to put out a sanitary pack. In addition to most thorough grading for quality, the processes of washing and sterilizing and the elimination of hand methods of handling the pack were carried to the nth power. Here many products made from dried figs were made ready for the trade, including whole dried figs, fig paste, fig meats and various confections.

Beckwith Orchard and Cannery

A trip through the fig belt would not be complete without a visit to the

mite on two sides of each tree. We have only 37 trees per acre and we recommend twice this number to the acre. We do not claim to have the most profitable planting but we harvested 88 tons from our 40 acres the past season. In addition to our crop, we bought a fair share of Kadotas from other orchards at five cents a pound. Our neighbor, R. S. Thompson, has about four acres of Kadotas in their fifth year, planted 65 to the acre, from which he harvested a total of 12 tons during the past season."

There are no mature Kadota orchards from which to judge possible yields, but Beckwith thinks that if planted about 20 or 25 feet apart in the sixth year, it would be conservative to expect a yield of three tons to the acre and gradually increasing to eight tons per acre in the ninth year and when mature. This would be equivalent to three tons dried. A conservative price of five cents a pound on the tree and a yield of eight tons would make a gross of \$800 per acre. Beckwith figures the yearly cost per acre runs between \$20 and \$40.

How Trees Are Pruned in the Beckwith Orchard

The Beckwith method of pruning starts with crowning the tree almost at the surface of the ground, and then producing a low branching form, with a hollow center but closed over the top. An opening is left on the north side of the tree. The fruit from such a tree is easily harvested from the inside and out without the aid of a ladder. Since the largest expense is connected with harvesting, this is a most practical consideration. The first crop, comprising only five per cent of the season's production, is borne on old wood. Ninety-five per cent of the crop comes on the new growth during the late spring and summer. It is an every-day picking job in a Kadota orchard from about August first to November 25.

Qualities of the Kadota Fig

Mr. Beckwith sums up the virtues of the Kadota fig as follows: It is light golden in color, rich in sugar and delicate in flavor. The skin is so thin that when preserved the fruit appears to be skinless and the flesh is so firm as to enable it to stand up when shipped fresh or under processing. It does not sour, split or smut. The seeds are almost invisible. These are the characteristics that make this fig unexcelled for shipping fresh, for canning, preserving and for fig specialties, spiced, candied, glazed, etc. The Kadota does not require caprification in order to mature as do the Smyrna varieties, which will not develop without pollinization from the male Capri fig. By the aid of caprification, the Kadota can be increased in size and made an excellent dried fig, and adds another asset to this all-purpose fig. Only about 50 per cent of the crop can be so treated as half of the crop is produced after the caprifying period has passed.

The ordinary rains which are so disastrous to the Calimyrna and Adriatic do not hurt the Kadota. The fact that the Kadota thrives best in heavy soils is a fortunate characteristic as there is practically no molestation from the nematode, the dread root parasite, in such soil. Within the past few years, the red spider has been the only pest noticed in Kadota orchards. This has been effectively checked by timely spraying with an atomic sulphur spray.

Comes Into Bearing Early

Not only is this tree the most rapid grower but it is the earliest to come into bearing and exceeds all other varieties in yields. In Beckwith's 25-acre nursery near Orange Cove, we found stock which had been set in March and in December had attained a height of 12 feet and a base diameter of over an inch, and on most of the larger yearling trees were to be found baby figs.

Experiments in processing the Kadota. (Concluded on page 45)



A thrifty five-year-old fig orchard at Pinnada, Merced County, California

the Mission, Calimyrna and Kadota varieties.

Canning and Preserving

At the new plant at Dinuba, we found another phase of the industry being developed—that of canning and preserving fresh figs. The plant is well lighted and spick and span throughout. Many new devices to handle the delicate ripe figs have had to be invented. In order to handle the crop during the rush season, the whole ripe figs are canned in water, in which form they are later converted into canned fig sirup, into preserves or, in the case of split, or

Beckwith orchard and cannery at Reedley. It is here that the largest acreage of the popular all-round Kadota is to be found. It comprises 40 acres, and was in its eighth year in 1923 at the time of my visit. Many of the problems of growing, harvesting and packing have been developed by N. E. Beckwith and son, Leonard. Concerning profits from their 40 acres of eight-year-old Kadota trees, the Beckwiths have the following to say: "Our trees were planted on top of hardpan, which in some places comes too close to the surface, but we are overcoming this by blasting with dynamite."

Essentials in Strawberry Culture

Part I.—The Strawberry's Story and Who Made It

By George M. Darrow

United States Bureau of Plant Industry

THE STRAWBERRY began its travels in America, then took a trip to Europe, and finally returned home. But the strawberry that took the trip to Europe was a very different individual than the one that returned. And the returned traveler was quite different from the highly developed strawberry of today.

It is to certain individuals, about six in number, that we owe our modern strawberries. Their part in the development of the strawberry is a great achievement and they have accomplished far more than a similar number of men who have worked with almost any other crop.

The Unknown Indian and the Firmest Strawberry in the World

The first hero of the story is an unknown Indian of Chili, South America, who, before recorded history, selected from among the wild strawberries which grew only along the beaches one which bore fruit of exceptional size "commonly as large as a walnut, and sometimes the size of a hen's egg." The fruit was light red with firm, meaty, pinkish-white flesh. Its flavor was not quite so aromatic and sprightly as the best variety of today, but was very delicate. It was far firmer than any we grow, firmer, even, than those shipped from Florida to all parts of the United States and Canada during the winter months, and firmer than those now coming to eastern states in late summer from California.

This variety, the Chilean, selected by the unknown Indian, travelled from Chili to Peru in 1557, not long after the discovery of America. It is still grown in Chili, Peru, Ecuador and other South American countries. A recent explorer, Wilson Popenoe, tells of having seen it picked into bushel baskets in the Andes Mountains, carried on mule back seven or eight miles, repacked into two to six-quart baskets, then shipped to a tropical seaport and kept for two and three days in such a climate. When canned, the Chilean strawberry holds its shape perfectly; much better than do our varieties.

The Strawberry Goes to Europe

The second hero in the story of the strawberry is M. Frazier, a French officer, who returned to Europe from

THIS is the first installment of a series of articles on strawberry culture. George M. Darrow, the author, is a member of the Bureau of Plant Industry of the United States Department of Agriculture. He has given special attention to small fruit culture and is recognized as an authority on the subject. Many subscribers have expressed approval of our series of articles on other subjects. We are sure this series will prove interesting.

Chile in 1714, bringing with him plants of the Chilean strawberry. Five plants were alive when he arrived at Marseilles, after a six months' voyage, during which fresh water was scarce. Forms of the wild strawberry of eastern North America had previously been introduced into Europe. From crosses of these two forms, the modern strawberry was developed in Europe.

Sex in the Strawberry Becomes Known

The third character in the story of the strawberry was also a Frenchman, named Duchesne. In 1760, when only 19 years of age, he published a book of over 400 pages on the strawberry, and in this book he discussed the difference in sex of strawberry flowers. He noted that some varieties had both pistils and stamens and bore fruit; others had only pistils and bore no fruit, unless they were near other varieties which could supply pollen; still others had stamens and pistils but were sterile. He also found that runner plants from each type of strawberry reproduced the form of the parent. Duchesne originated new sorts of strawberries by crossing, probably being the first one to actually make crosses of fruits.

The First Strawberry Breeder

The fourth great character in the story of the strawberry was an Englishman, Thomas Andrew Knight,

who about 1820 originated a new variety of strawberry which is still grown in Europe. He made artificial crosses and proved that systematic breeding would result in improved varieties. Besides this, he showed the way to the great number of careful and painstaking strawberry breeders whose originations have made possible the present commercial industry.

Sex in the Strawberry Rediscovered in America

The fifth great character in strawberry history was Nicholas Longworth, the grandfather of Congressman Longworth of Ohio. Though the difference of sex in strawberry varieties had been discovered in Europe, few people in America knew of it, and none appreciated its importance until Longworth rediscovered it some time before 1834.

Longworth and his associates examined millions of flowers and noted four distinct types of varieties of strawberries. These were: (1) plants which bore only pistillate flowers (containing no stamens); (2) plants which had only staminate flowers (containing no pistils); (3) plants which produced hermaphrodite or perfect flowers (containing both stamens and pistils); and (4) a class, having both pistillate and hermaphrodite flowers on the same plants. He published his results widely, and since

his time the differences in the sex of strawberry plants have become commonly known. Of these, pistillate and perfect-flowered varieties are well known at present. Staminate varieties producing flowers containing no pistils are very rare, while many of our perfect-flowered sorts often produce many pistillate flowers. Longworth advocated the growing of pistillate varieties because they were by far the most productive, but he recommended the planting of alternating rows of perfect flowered sorts in fields with pistillate varieties for pollination.

Longworth found by examination and tests that not over one-third of the flowers of any perfect-flowered variety ever set fruit. On the other hand, all, or usually all, of the flowers of pistillate sorts set fruit. Thus, the most productive perfect-flowered sorts of that time produced only one-third the crop of pistillate sorts and most of them were far less productive.

This discovery of Longworth's has been largely lost sight of today and yet, as will be discussed in a later article, it is probably the most important discovery for commercial strawberry growers today. Probably the perfect-flowered varieties of today set, on the average, more than half of their flowers, and they are, therefore, a great improvement over those of 75 years ago. Under some conditions at present, however, not over one in five flowers set, while under the best conditions nearly all do.

Discovery of the Use of Refrigeration in Transit

The sixth great character in the story of the strawberry, though just as important, worked along a very different line. Refrigeration in transit was essential to the development of the modern industry of long distance shipment of strawberries. Parker Earle started this in 1866 when he began shipping chests containing 200 quarts of berries and 100 pounds of ice from southern Illinois to Chicago, New York, New Orleans and other markets. In 1869, he began shipping by the railroad, icing the car, and by 1872 he had started to precool the strawberries in an especially constructed house before placing them in the iced car for shipment. He and

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Summary of Fruit Crop Prospects

By C. E. Durst

LAST year we published a summary of fruit conditions and prospects during the spring months. The information was obtained from leading authorities all over the country and was as dependable as it is possible for such information to be. This service was apparently much appreciated, and we shall therefore print a similar summary during the next two or three months. After that time the government crop estimates will cover the situation effectively.

In the summaries given below, the state is named, as well as the date of the report and the name of the person furnishing it. It should be remembered that the giving of an opinion on crop prospects at this season is a treacherous undertaking. The best authorities can easily make mistakes. Conditions change rapidly. These factors should be taken into account by subscribers in reading these summaries.

Massachusetts (March 17).—Fruit prospects are generally good. There should be a heavier crop of apples than last year. Peach buds are safe thus far and there should be a crop. Grapes and small fruits are in good condition. There has been no serious injury of any fruit. The season is backward, and there is still much snow in many sections. Pruning is well under way.—F. C. Sears.

New York (March 12).—Prospects

for a fruit crop are favorable. The trees grew well last summer, and there was good fruit bud formation. There has been no winter damage even to tender fruits. Peaches on the outskirts of the commercial district have come through the winter without damage. There is little danger of winter killing from now on. Growers have been delayed in pruning by prolonged winter weather. With favorable spring conditions, New York should have a good fruit crop.—A. J. Heinicke.

New York (March 16).—Fruit prospects are favorable, although the season has not yet opened up in the western fruit belt.—J. D. Luckett.

Pennsylvania (March 10).—Apple buds in general are in good condition and peaches are likewise. Usually peach buds are winter killed to a considerable extent in this state, but so far there has been no serious damage. It is too early to speak with accuracy, but fruit crop conditions are promising at this time.—S. W. Fletcher.

Maryland (March 11).—It is too early to make predictions, but at the present time prospects are excellent. So far we have had no winter injury. Both apple and peach trees have plenty of fruit buds, and the trees

are perfectly dormant. Prospects are now in favor of a late bloom, and at this time we are expecting an excellent crop.—E. C. Auchter.

Virginia (March 15).—We have had an excellent winter for fruit and the prospects at this time are encouraging. Snow fell last week and is still on the ground.

Apple buds are still quite dormant. Peach and plum buds are swelling in spite of the backward weather. Some orchards in eastern Virginia are showing pink, but I have not yet seen any in bloom.

Apple prospects are very good in orchards which were well cultivated last year. In uncultivated orchards in the drought sections, the buds were damaged and are not in such good condition.

With favorable spring weather, Virginia should have a good crop. The state has not had a good crop for six years, and we feel we deserve a normal crop this year.—F. A. Motz.

Michigan (March 13).—At the present time fruit buds in Michigan are in excellent condition. They have come through the winter with very little killing. They are entirely dormant as yet and the chances seem good for a late spring. Of course, there are some six to eight weeks yet

during which we may expect trouble.—V. R. Gardner.

Ohio (March 15).—Apple prospects are favorable at this time with varieties that fruited lightly last year. Part of the peach buds were winter killed, but enough are alive for a crop if conditions are favorable from now on.

In the Lake Erie district, the drought last summer caused a light setting of buds. However, there are enough live buds for a fair crop in well cared for orchards. In Washington county in southeast Ohio, peach buds were pretty generally killed, the temperature reaching 18 degrees below zero. In Belmont county, both the peach and apple buds are in good condition. In some parts of central Ohio, there was considerable killing of peach buds, but apple prospects look good.—J. H. Gourley.

Indiana (March 9).—The set of apple buds generally is good but the drought last summer weakened the buds in sod orchards and in some of the cultivated orchards, and this may cause a light setting of fruit. Favorable spring weather may overcome this tendency to a considerable extent.

The peach situation is not so promising. On young trees and on older trees in lower elevations buds are reported 100 per cent kill. On older trees and on higher land there are in

(Concluded on page 42)

New Tropical Fruits in Florida

By Hamilton M. Wright

FOR SEVEN days I had traveled on a mule across the picturesque plateaus of Guatemala. The journey led from Guatemala City past the ruins of the former capital, old Guatemala, better known simply as the old city Antigua. Thence, via Panajachel, on the shore of the picturesque volcanic lake of that name, which is called Lake Atitlan on the maps. And, finally, passing pine forests and wheat fields upon which smoking volcanic cones looked down, I reached Totonicipan, situated in a beautiful amphitheater among the hills, and at a level of 8300 feet above the sea.

Here for the first time I was able to enjoy fresh fruits, for Totonicipan produces fine peaches. It also produces the avocado or alligator pear, which I had not thought to find at so high an altitude. The Indians esteem it greatly, and I found the avocados especially fine. The air gets quite cold at night at this elevation and it gives the fruit an excellent flavor. I had eaten avocados in the Philippines and in Hawaii, developing a fondness for the fruit which, in a way, is like the olive in that a liking for it is often a cultivated taste.

The Avocado, "The Perfect Food"

The avocado, pronounced by some notable dieticians to be "the perfect food," is now being grown successfully in Florida and exported to an increasing extent to the North. It is finding so much favor with growers there, and the effort to popularize it has so advanced that an "Avocado Day" was officially declared by the mayor of Miami about two years ago.

Many varieties of the fruit are grown—some of them of large size, reaching two and three pounds. Much hope is expressed for the development of frost-resisting avocados, with the idea of extending their range further North. Undoubtedly some varieties will withstand a greater degree of cold than others, and I think their growing at an elevation of 8300 feet shows they can withstand some cool weather. But though the nights get cool, especially before sunrise, this is the usual tropic chill, which may seem bitter cold at 45 degrees. Friends have told me they have seen avocado trees stand occasional frosts in Mexico. Most authorities on tropical fruits are of the opinion, however, that the natural disposition of tropical plants to live in the tropics will never be greatly modified.

There are vast spaces in Florida in which avocados and other tropical fruits could be raised after a suitable study of their requirements. The climate of southern Florida has enabled the United States Plant Introduction Station near Miami to introduce many new varieties of tropical fruits that are unknown to millions of North Americans. Many of these new fruits are indigenous to the nearby West Indies and to Central and South America, while others have their na-

tive home in southern India and the Straits. West Indian fruits taken to India more than 200 years ago are now firmly established there. The climate of south Florida and the Florida Keys is suitable to many plants indigenous both to southern India, Central America, the West Indies and other tropical regions. It is, in fact, a meeting place for various plants

and other fresh fruit. While avocado growing on a large commercial scale is in its infancy in Florida, the tree flourishes in the Redlands district south of Miami. The most desirable varieties bring from \$6 to \$30, and even more, per crate of 36 to 40 fruits. Seventy trees can be grown on an acre, yielding from one to three crates at six years old, and



Fruits of the White Sapote (*Casimiroa edulis*) grown in the United States Plant Introduction Garden, Miami, Fla. The fruit is yellowish, with soft, melting flesh, and sweet or slightly bitter flavor, ripening in May.

and animals of the temperate and tropic zones.

The avocado is a real food. There is nothing in the definition of the word fruit which prevents it from being regarded also as a food, except the fact that many fruits are limited in the nutrition they supply. This is not the case of the avocado. The United States Department of Agriculture provides the following analysis and comparison between milk and eggs, and the avocado:

	Avocado	Egg	Milk
Water	72.8	73.7	87.0
Protein	2.2	1.48	3.3
Carbohydrates	4.4	...	5.0
Fats	17.3	10.5	4.0
Crude Fiber	1.4
Ash	1.9	1.0	.7

Further comparison is furnished in the statement from the same department which follows:

"Eggs contain a combination of substances intended by nature, with the action of heat and moisture, to revert into life and activity; milk contains the natural substances in the most correct proportions to build, sustain and repair friction from action in animal life, especially in its infantile stages; the avocado contains the elements of food intended by nature to build, sustain and repair animal life in its advanced stages, when friction is greatest by the activities of life."

In other words, the avocado is very good food for active people. Natives of tropical countries have told me it takes the place of meat. The protein content is greater than that of any

while data on actual profits in avocado growing are not readily available, many individual trees have returned thousands of dollars to their owners.

The Banana

Tropical fruits have not been invariably popular when introduced into northern markets. The reason, in many cases, is not to be ascribed to outstanding faults of the fruits themselves. Difficulties in the way of refrigeration are apt to result in the most accessible tropical fruits coming in too raw or too ripe. Of course, the banana comes in green and, at present, constitutes an outstanding exception. Then again, there are many

little known but very appetizing tropical fruits which are not produced on a commercial scale. Like Topsy, they have "just growed," and cannot be handled on a wholesale basis. Moreover, dwellers in the tropics, as well as those who live in more northern climates have developed preferences for fruits characteristic of the regions in which they live, and this must be taken into account in introducing tropical fruits into the North. Some tropical fruits are considered insipid by those who taste them for the first time. But there are many delicious varieties which grow wild



A fruit of the *Anacardium occidentale*, much prized in the tropics. (Photo courtesy United States Plant Introduction Station, Miami, Fla.)

introduction on a large scale to the United States dates back but little more than a generation. Some of these fine fruits have been introduced into Florida and find there a congenial climate. Careful studies have been, and are being made, of best methods of propagation. They are but the forerunners of almost innumerable other tropical fruits, vegetables, ornamental plants, forages and grasses that will be rescued from the inertia of native tropical mismanagement.

The Mango, a Fruit of Many Uses

Much progress has been made in southern Florida in the cultivation of the mango. This is the famous fruit and umbrageous evergreen tree of which a specimen was presented to Buddha that he might find relief in its shade. Some of the oldest mango trees in the vicinity of Miami have been cut down to make way for the real estate boom, but the tree is cultivated as far south as the Redlands district on the east coast. The mango is a native of south Asia and the Malay Archipelago. Some of the best specimens of the fruit raised in Florida now bring as high as \$1.50 each in the northern hotels, although almost all of the product is consumed locally. The choice budded varieties, such as the Haden mango, a local development; the Mulgoba, from India; the Saigon, a Chinese variety; and the Subdersha from East India, with their rich, spicy flavors, tempting fragrance, and beautiful coloring, make one of the most attractive deserts that can be imagined.

Three varieties of mango are now being planted in commercial orchards in the region of Homestead, south of Miami. They are the Mulgoba, the Haden, and the D'O. The quantity of these fine fruits has been so limited that they have been sold at fancy prices, but it is hoped in the near future to produce them on a commercial scale. Growers are eliminating degenerate and jungle varieties containing much fiber which have injured the reputation of the mango. The government experts by selective breeding have improved many of these stocks, reducing the fiber and improving the quality generally. A large variety of mangoes has been introduced and fruited.

The mango can be cooked and preserved in a lot of attractive ways. Green mango pie, ripe mango pie, fried mangoes, mango dumplings, canned mangoes, mango marmalade (one of the most delicious of marmalades), mango jelly and mango sweet pickle are among the recipes that a lady of Fort Lauderdale has tried out.

The Star Apple

A very delicious and quite nourishing fruit is the star apple. It has been introduced from Jamaica, Cuba, and other nearby regions of tropical America. The tree grows in Florida to a height of about 30 feet, but unfortunately its range seems limited.

(Continued on page 40)



Marilyn Thompson of Miami eating a new variety of mango fruit. The fruit is juicy and of rare quality. The best varieties often bring as much as \$1.50 per fruit.



Avocados grown in Florida

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New Fruit Production Program for the Pacific Northwest

By F. L. Ballard
Oregon Agricultural College

THE FRUIT industry of the Pacific Northwest has been built up within comparatively recent years. As might be expected, many serious mistakes were made in this great development. Fruit was planted in some places where the conditions were not adapted for it. Some kinds of fruit have been overplanted, while others have not been planted in sufficient quantity to meet the market demands. Some varieties have proved unprofitable, while others have proved well suited to the climate and demand.

The industry of the Northwest is just now in a reconstruction period. Thoughtful, far-visioned men—and there are many of these in this section—have been giving careful consideration to the problem before them. As a result of the early experiences and with a regard for the future, the horticultural leaders of Oregon not long ago conceived the idea of making a careful survey of the present and potential production in relation to market demands with the object of developing the best possible program for the future. The first step consisted in holding meetings in the different fruit sections. Committees were appointed to make certain investigations. Farm organizations, chambers of commerce, county bankers' associations, the agricultural college, commission dealers, managers of co-operative associations, all were included in these meetings and on these committees. The state's agricultural condition was very thoroughly inventoried.

Marketing Problem Most Serious One

It was found that the question of what will grow is a minor one. Nearly all of the products common to the north temperate zone can be grown in commercial quantities in some part of Oregon. The state was already producing a surplus of all its staple crops, except corn, pork and sugar, so the question was, what can be sold? This question attracted unusual interest because the state's first industry is lumbering, and the first growth timber, except that in the forest reserves, will be exhausted in 30 years, it is estimated. Then, in consequence, the state will become an agricultural state, and its future prosperity as an agricultural state depends upon the prosperity of those now upon the land, was the thought.

Approximately 24 per cent of the state's income from agricultural products is derived from fruits, nuts and vegetables, it was found. Apples, prunes and pears make up the larger portion.

Investigation of the possibilities in horticulture brought out the fact that the industry has had its ups and downs. During boom periods economic conditions were incorrectly interpreted, and plantings were guided by fancy instead of reason. The fact was overlooked that the producer of any commodity is to a large extent a servant of the consumer.

The conclusions were that the fruit industry of Oregon should be guided rather carefully and, if possible, along those lines for which the state is particularly adapted and in which the least competition will be met.

Convention Held at Agricultural College

Committees studying the fruit problem, and several others as well, uncovered so much material of value that a big conven-

tion was called at the Oregon Agricultural College to consider the economic factors bearing on each of the state's major agricultural industries. The result of the considerations of the committee on horticulture at this meeting was a decision to go slow on apple planting.

Consideration of pear production was more encouraging. The pear growers of the state have been relatively prosperous and interest in pears is keen. Pear production has been decreasing in the East. On the Pacific Coast, on the other hand, it has advanced rapidly, especially in California. About 90 per cent of the California acreage is Bartlett, it was brought out, and the main acreage in the neighboring state of Washington is Bartlett. In Oregon, however, the tendency has been toward winter pears, of which the Anjou and Bosc have been good money makers, and so a moderate increase in winter pears was the sentiment. But go slow on Bartlett, was the suggestion. California is established as the canning center, with orchards already planted to produce 350,000 tons in 1933. If all goes well, the outlook is that the Bartlett pear business is pretty well taken care of.

Other recommendations based on careful study of national and international market conditions and local production possibilities were: Eliminate as rapidly as possible off-varieties of apples; increase yield of apples; aid in developing a moderate increase of winter varieties of pears, and improve quality of pears by better cultural and handling practices.

Plant Pears Conservatively

It was brought out that pear growing is, to a large extent, a business for specialists; that pear orchards in the Rogue River Valley ran close to \$40,000 per farm in investment, and that general pear planting is likely to prove disastrous.

The consideration of nut culture brought out that markets are confined to the United States because of low production costs in foreign countries. The consumption of nuts in the United States has increased nearly 400 per cent since 1900. In the meantime, the plantings of nuts have increased approximately the same percentage, but only 60 per cent of the plantings are now in bearing. Recommendations along this branch in horticulture were that moderate plantings in walnuts

and filberts were advisable. Such plantings should be confined to districts and localities known to be suitable and should be made from proven varieties—Franquette walnuts and Barcelona filberts, and 11 to 16 per cent of the filbert plantings should be pollinizers.

In the field of cherry and berry production, it was brought out that the small fruit acreage in Oregon has increased more than 300 per cent since 1909 and that the canning industry has made rapid strides forward.

The Small Fruit Situation

In small fruits, increased acreages of loganberries and blackberries were discouraged, while increase in strawberries and raspberries was encouraged as offering considerable opportunity for profit as the cannery business continues to develop.

Increased acreage of Royal Ann was recommended in the field of cherry production. Where the demand for fresh fruits seems greater than the supply, as east of the Cascade Mountains, increased planting of Bings and Lamberts was recommended. Further planting of sour cherries was not encouraged, except for local cannery demands.

The survey indicated that prune production will reach 400,000,000 pounds of dried fruit annually within the next five years. Unless the average per capita consumption is increased in the United States, there will then be 226,000,000 pounds of dried prunes for the export market. In only one year has the export demand ever approached this amount.

Further increase in prune acreage was discouraged.

General increases in production of truck crops were recommended, and it was brought out that such production might well take the place of orchard enterprise in many districts, owing to more active demand for celery, onions, broccoli and general vegetable crops for canning purposes.

Local Problems Also Considered

Since this analysis of the horticultural situation was made, meetings have been held in 18 counties to bring these facts and many others of similar origin before the local people and to consider local problems as well. The conclusions of the orchardists in every county have been published and used as a general guide for the industry. The conclusions of the Hood River

county orchardists are a typical example. Ninety per cent of the agricultural income of Hood River county is from fruit. The following are extracts from the Hood River program:

"Success or failure in the apple business of Hood River is to a large extent a matter of varieties, and the Newtown necessarily must take first place. The Spitzenberg has a limited place only. Lack of hardiness is one of its definite limitations. Arkansas Blacks are worthy of future planting, likewise Delicious. Topworking is not to be recommended. Twenty-five per cent of the growers included in a recent survey secured an annual average production of 386 boxes per acre, and 37 per cent were credited with only 186 packed boxes. The latter yield is too low for profit.

Pear Growing Looks Promising

"Certain sections of Oregon are especially adapted to the culture of the pear, and the pear industry seems destined to continue as one of the important enterprises of the state. It must be borne in mind, however, that pear growing is largely a business for the specialist. In all probability, the commercial culture of the pear will continue to be centered largely in certain definite localities that enjoy special advantages and that make pear growing a major enterprise. General pear planting throughout the state does not seem advisable, though a moderate increase in plantings, especially of the winter sorts, may be expedient in certain districts.

"Experience of the past 30 years shows that certain varieties of pears do well in the Hood River Valley. Fire blight thus far has not been a factor here. Fairly high yields of quality fruit can be produced under certain conditions. A moderate increase in pear plantings seems feasible in Hood River at this time. Where land is available for new plantings, serious consideration should be given this crop.

"The practice of planting pears on soils not suited for growing apples is discouraged.

"Pear growing is especially recommended for the grower who has over-specialized in apples.

"Bartlett pears of exceptional quality are produced in the Hood River Valley. This variety has been widely planted elsewhere, however, and it is questionable whether the market can stand a very great increase in the tonnage of this variety. In cases where a decidedly late Bartlett can be produced, there are possibilities for late shipment.

"Anjou appears especially promising for the Hood River Valley. This variety is not being planted to a great extent in other sections. It is only a moderate producer, but its fine dessert and

keeping qualities counteract this to a large extent.

"Bosc does fairly well in most parts of the valley, but this sort is being widely planted in many districts and presents some rather serious problems of harvesting and storage.

"Winter Nelis is a desirable pear in many ways, but does not do as well under Hood River conditions as in other parts of the Northwest.

"Flemish Beauty appears to have possibilities, provided it is not too widely planted.

"Easter does well and also has possibilities. Indica-

(Concluded on page 32)



A northwestern prune orchard

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SPRING

—plans for re-decorating the home, for the garden, for the family, for the summer pleasures, Spring needs in wearing apparel, new clothes for the children, everything that thoughts of Spring call to the Woman's mind are supplied in Ward's Spring Catalogue.

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China
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Beautify the Home

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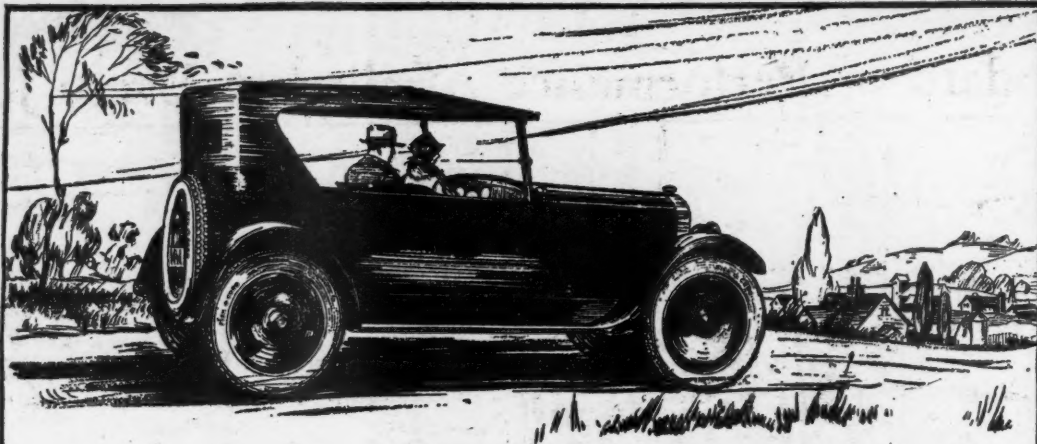
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CORD TIRES

Intercropping the Young Orchard Profitable in Southern Indiana

By F. C. Gaylord
Purdue University

THE FIRST three or four years of a young peach orchard's existence usually means everything on the debit side of the ledger. With apples, twice this length of time must be counted out before the young apple orchard begins to make any inroad on the ever mounting overhead expenses.

Thus in southern Indiana intercropping has proven a boom to many apple and peach orchardists, who have found that tomatoes, both for early truck and canning factory, sweet potatoes, string beans, and cantaloupes not only pay the overhead but often return handsome dividends beside.

B. F. Nesbitt of Knox county last year contracted 9.33 acres of tomatoes to a canning factory. Five rows of tomatoes were planted between each two rows of young peach trees. The crop was planted the last of May and the tomato plants were disked under in early October, so that a cover crop of rye could be sown early enough to make a splendid growth before winter arrived.

On the 9.33 acres Mr. Nesbitt delivered an average yield of 10.28 tons, or a total of 95.91 tons of red ripe tomatoes. At the contract price, these brought \$1247. Aside from this, Mr. Nesbitt joined the Indiana Ten Ton Plus Tomato Club and because he grew more than the required 10 tons per acre, he secured an extra bonus of 50 cents a ton, or a bonus check of \$47.95, and a bronze medal from Pur-

due University as a reward for a profitable crop. As an intercrop in Nesbitt's peach orchard, the tomatoes averaged a little over \$133 an acre and at the same time kept his orchard in excellent tilth, so that the young peach trees made a vigorous growth. Cultivation was stopped early enough so that the young peach trees stopped growing early and were in excellent condition for winter.

To secure this yield 500 pounds of a commercial fertilizer per acre, analyzing two per cent nitrogen, 12 per cent phosphoric acid and six per cent potash, was applied broadcast just before setting the tomato plants. Good, vigorous tomato plants were set and given excellent care throughout the growing season.

Many other growers were equally successful in using tomatoes as an intercrop to carry the overhead both in the young orchards and also in bearing orchards, where last winter's freeze cut short the fruit crop. Tomatoes have the added advantage of growing successfully on a wide range of soils and do equally well on sweet or sour soil.

Another crop that has been most successful as an intercrop on the sands of Knox and adjoining counties has been sweet potatoes. N. Y. Yates, another southern Indiana fruit grower, secured 300 bushels of potatoes between the rows of young peach trees. These were worth at digging time around \$1.25 a bushel. Yields of from 300 to 600 bushels in good years have been secured between the peach and apple trees. In fact, almost every grower in this section has found that at some period in a young orchard's existence, intercropping with sweet

potatoes, early tomatoes, cantaloupes and late tomatoes has helped to develop the peach and apple orchard and made the overhead burden a much simpler matter.

Everbearing Strawberries a Commercial Crop

By Charles H. Chesley

I HAVE been experimenting with everbearing strawberries for 10 years and have learned something about growing them, but as a commercial crop I have not considered them of much value. However, some of the things learned last year have changed my mind in the matter. We have had strawberries more or less abundantly each fall, beginning about the middle of August and lasting until killing frosts destroy the blossoms and freeze the green berries. If the season proves excessively dry, the berries are not as good, indicating that a lot of moisture is needed. The overhead irrigating system would doubtless prove profitable in growing the berries.

Perhaps one of the most notable successes with everbearers in this section of the country is the Titus Farm in Rollinsford, N. H. The crop has been grown in a commercial way for a number of years. Mr. Titus gave his methods of growing the berries at a farmers' meeting last year, and the information seems worth passing on.

A new plantation is set each spring. The soil is a rich clay loam that holds moisture well. Cultivation is practiced until along in July and the buds and blossoms picked off until about that time; then the berries are allowed to set and ripen. After that

time the runners are thrown out and plants are allowed to set for the following spring. The crop of berries must be taken off the year the plants are set. The plants will not bear two fall crops of any value. A fair crop of good berries may be obtained the following spring, but after this second crop is taken off, the plantation is plowed under. It seems that two fall crops of any value cannot be obtained from the same plants.

The owners of this farm have had no trouble in disposing of all the berries they can produce in the nearby industrial cities at prices high enough to insure a profit. The labor cost of producing this class of berries is somewhat higher than that for the ordinary kind of spring bearers because of the extra cost of cultivation and gathering the blossoms. However, the prices received average about twice as much as the June crop brings. It is doubtful if the labor cost is twice as much.

One thing is certain in connection with the fall bearers. Growers do not have to wait as long for the returns, as they get the most of the profit the first year. This is a point that gives the everbearers favor in the eyes of many growers.

I believe it is necessary to plant the berries upon soil that holds the moisture well, or supply moisture in an artificial way. There must be considerable moisture in the soil to insure a crop of good berries. If the ground is dry, they will be small. It follows, therefore, that we must set the everbearers upon rather moist soil. At the time the spring berries are produced, the soil has not dried out, while the moisture may have practically become exhausted when the fall bearers are ready to produce.

The South Haven and Casco Pomological Society

THE SOUTH HAVEN and Casco Pomological Society held its annual meeting at South Haven, Mich., on Friday, February 12. This little society has had a most unique history. It was organized in 1872 and has held meetings regularly ever since. In its early years meetings were held at the homes of members, sometimes every week. For many years the society met in Pomological Hall, a building located in a park on the north side of South Haven and used exclusively by the society.

In its history the society has been addressed by some notable horticulturists. The minutes show that L. H. Bailey addressed the society when a boy. Several prominent horticulturists and agricultural leaders have been members of the society.

Such an organization is an important factor in the life of a fruit growing community. It brings growers and their families together, and in this way it promotes a better understanding and a better spirit of co-operation between them. The community is always improved as a result. Every fruit growing community in the country would be the better for it if it had a society similar to that at South Haven and Casco.

At the recent meeting, dinner was served at the Congregational Church. Dinners have been dispensed with for the last couple of years, but the officers returned to the serving of dinner this year because it encourages a larger attendance. About 75 growers and members of their families were present. After a short business session, the society was addressed by C. E. Durst, Managing Editor of the AMERICAN FRUIT GROWER MAGAZINE. Mr. Durst discussed the agricultural situation in general, calling attention to the inequalities which exist in agriculture as compared with other lines of business and outlining possible methods of solution of the problems.

The present officers of the society are: H. E. Merritt, President; Floyd Borden, Vice-President; L. A. Spencer, Secretary; and M. T. French, Treasurer.

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The Editor's Mail Box

Pressures for Galvanized Pipe

AMERICAN FRUIT GROWER MAGAZINE: I have read with much interest the article by O. G. Anderson in the February issue. Piping my orchard seems to be the best solution of my spraying problem.

About what pressures would be safe for ordinary galvanized pipe, commercial black pipe and second-hand pipe such as can be bought from a wrecking company?

Would a one-inch main with three-fourths inch branches be large enough to supply two spray guns, each working from a different branch? If this can be done, what power would be necessary?

When lime-sulphur and lead arsenate are mixed, a heavy black precipitate is thrown down. This has given more or less trouble in our present spray machinery. Would it not be necessary to make provision for cleaning the pipes other than washing them with hot water?—W. K. T., Minnesota.

ANSWER: The ordinary galvanized pipes of size three-fourths inch to one and one-half inches are not guaranteed against any certain pressure but will ordinarily hold 1000 pounds with perfect safety. It is very seldom indeed that pipe will burst with 1000 pounds or near it. The ordinary commercial black pipe has practically the same strength as the galvanized pipe and can be treated the same in all ordinary work. It works more rapidly and for that reason is not as long lived. Second-hand pipe will ordinarily hold 500 to 700 pounds pressure without difficulty. It will vary, however, from that which may be rusted badly to that which is practically as good as new. Defects that are serious enough to be readily recognized by casual examination can be eliminated. Defects that are not deep enough to be readily recognized are seldom serious enough to eliminate the pipe from spray usage. Pipes that come from buildings where acids, alkalis or chemicals of any kind have been used should be very carefully examined or avoided.

A one-inch main line will carry three or four guns in very good shape. Under separate cover we are sending you a bulletin on stationary spray plants. In this you will find the carrying capacity of the different sizes of pipe, and the friction loss. You will see that two lines of hose can ordinarily be connected to a three-fourths inch line not more than 500 feet long without serious loss of pressure. If the side lines of three-fourths inch pipe are as much as 1000 feet long, it is not advisable to connect two guns to such a line.

In the stationary spray plants used in this state, there has been practically no trouble resulting from sediment or deposits in pipes. Most of the pipes are so laid that they can be washed out with water after the use of lime-sulphur spray materials. They are not uniformly washed out after use with the arsenate of lead sprays. The combination spray of arsenate of lead and lime-sulphur is not very generally used in Washington.

In washing the pipes, clear water is simply run through them until it comes practically clear through the faucet.—O. M. Morris, Head, Department of Horticulture, State College of Washington, Pullman, Wash.

Should Fruit Spurs Be Removed?

AMERICAN FRUIT GROWER MAGAZINE: In pruning young apple trees according to the modified leader system, how many secondary branches should I leave on the main branches; how many on the secondary branches; and how many on the tertiary branches? Should all other branches be removed entirely or cut back to stubs?

Should fruit spurs be allowed to grow on the trunks of trees or on the main and secondary branches?

My orchard is on hilly ground. Should I cultivate only a strip on each side of the trees or the entire surface?—T. L., Missouri.

ANSWER: In pruning young apple trees according to the modified leader system, you should leave

three or four main branches besides the leader. As these develop, they should be pruned to two or three secondary branches each. After that, you should simply aim to direct the growth in such a manner that the space will be uniformly occupied.

The branches which are not wanted should be removed entirely. It is not a good thing to cut apple trees to stubs. Occasionally, branches are cut to a lateral which extends in a fairly parallel position.

The spurs should be allowed to remain on the trunks and branches of the trees. It is scarcely ever good practice to cut out fruit spurs.

On hilly land, I do not believe it would be a good thing to plow the strip of land adjoining the rows of trees. I think it would be better to cultivate the soil, taking care not to cultivate so deep near the trees that you will injure the roots. You can use either a one-horse cultivator or a spring tooth harrow.

Preserving Fence Posts

AMERICAN FRUIT GROWER MAGAZINE: Please give me directions for treating wood posts so as to preserve them against rotting.—R. L. T., North Carolina.

ANSWER: You can increase the life of your fence posts materially by treating them with a preservative before building your fence. Coal tar creosote is one of the best preservatives. First peel the bark off the posts, then bevel the tops and allow the wood to become thoroughly seasoned before treating it. The posts will season very well if piled up on the outside with supports under them so that they will not touch the ground.

For farm conditions, the open tank method will prove one of the best. Bring the coal tar to a temperature of about 200 degrees Fahrenheit. Submerge the butt end of the post in the tar for at least an hour. A second immersion for a few moments in a tank of tar at about 100 degrees will prove an additional advantage.

The cost of treating a post is usually not more than 10 cents. A gallon of coal tar will treat from 10 to 12 posts.

Treating Seed Potatoes for Scab

AMERICAN FRUIT GROWER MAGAZINE: Please give me directions for treating potato seed for scab. My potatoes were very scabby last year, and I want to avoid this the coming year.—A. E. W., Missouri.

ANSWER: The best treatment for potato scab is immersion in corrosive sublimate solution. This material will control all the diseases that formaldehyde will, and some others in addition.

Dissolve four pounds of corrosive sublimate (also called mercuric chloride) in a small quantity of warm water. Use an earthen, porcelain or wooden vessel, as the material corrodes metal. After the crystals are fully dissolved, add to water to make 30 gallons in all. A barrel may be used for the dilute solution.

The potatoes should be treated before they are cut. They may be immersed in a sack, but a wooden crate made of slats is probably best. Seed which has withered and which is not badly sprouted should be treated for about 90 minutes. Potatoes that are badly sprouted should be immersed about 30 minutes to avoid serious injury to the sprouts. The solution weakens rapidly with each treatment, and a new solution should be made after three lots of potatoes have been dipped in it. The potatoes should be spread out to dry as soon as they have been immersed.

Corrosive sublimate is a deadly poison. Keep it from children and animals. Discarded solutions should be emptied where they will quickly disappear into the ground. Every vessel used for the solution should be thoroughly cleaned before being used

for other purposes. If a wooden barrel is employed for holding this solution, it should be used for treating potatoes and for nothing else.

Fastening the Wires in Wire Bracing

AMERICAN FRUIT GROWER MAGAZINE: In the method of spreading the branches by tying them down, please inform me how to tie the limb that is to be bent so that it will not be strangled or injured. Is there not danger of insects and diseases lodging at the places where the wires are fastened?—W. C. D., Pennsylvania.

ANSWER: The best method by which to attach the wires to the branches is to use screw eyes and insert these in the under sides of the limbs. Of course, you would have to insert them low enough in the branches so that they will hold securely. This is the common method of attaching the wires. The other ends of the wires should, of course, be fastened to stakes driven into the ground. Of course, you will damage the branches slightly, but this will produce no evil effect. After the branches have been brought down, you can remove the screw eyes, provided the branches have not grown large enough by that time to enclose them. However, if you do not wish to remove the screw eyes, or if it is impossible to do so without damaging the branches, you can leave the screw eyes in place without fear of damaging the trees. The branches will grow over them eventually and the trees will be none the worse for this.

Growing Red Cedar Seedlings

AMERICAN FRUIT GROWER MAGAZINE: Will you kindly give me directions for growing red cedar and Austrian pine seedlings from home collected seed in a dry, hot climate like Kansas?—J. K., Kansas.

ANSWER: The seeds of red cedar seedlings and Austrian pine seedlings often remain dormant until the second year. This is particularly true of red cedar. Quite often, however, the red cedar seeds can be sprouted by gathering the cones in the spring, removing the seeds and sowing them immediately in a warm place. Sometimes the seed is mixed with wood ashes for a few days in order to soften the seed coats.

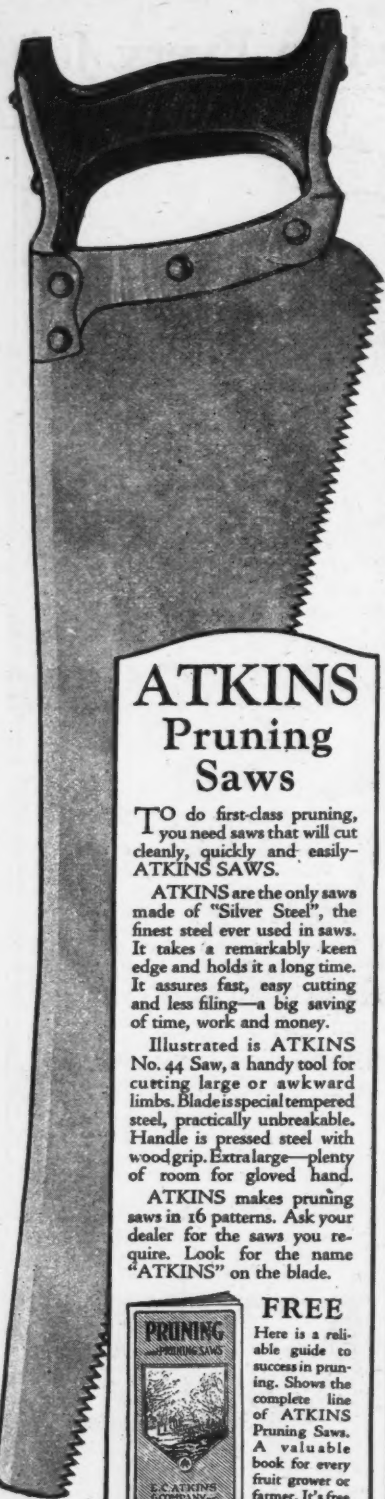
The cedar and pine can both be propagated from green wood cuttings if they are placed under glass in sand and kept moistened. Mature cuttings can be taken in the fall and stored in a cold frame during the winter and rooted in the spring. Most pines and cedars can be grafted on seedling stocks readily, and in this way particularly good varieties can be multiplied. Cedars and pines can also be propagated by veneer grafting. It is best to handle such grafts in a cool greenhouse.

Control of Apple Maggot

AMERICAN FRUIT GROWER MAGAZINE: The apple maggot is causing me a lot of trouble. Can it be controlled in the same way as codling moth? The eggs are deposited just under the skin of the apple. On hatching, they burrow through the flesh of the fruit. The larva is a yellowish-white maggot about one-third inch long.—J. P., New York.

ANSWER: The apple maggot is a more difficult insect to control than the codling moth. The young maggots never leave the apple until they are full grown, and it is therefore impossible to kill them with poisons or contact sprays. The only way the insect can be combated is by keeping the surface of the fruit and leaves covered with arsenate of lead during early July when the adults appear. The adults begin to lay eggs about three or four weeks after they appear. At that time they eat the waxy covering of the fruit, and poisons on the fruit at that time will kill most of the adults.

Some authorities recommend the



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ATKINS SILVER SAWS

for April, 1926

addition of molasses or syrup to the spray in order to make the arsenate stick better to the fruit.
Apple maggots are not as serious in well cultivated orchards as in those not cultivated. Good cultivation destroys large numbers of the insect in the resting stage.

Fruit Tree Bark Beetles

AMERICAN FRUIT GROWER MAGAZINE: The bark on many of my peach trees looks as though it had been punctured with fine shot. Sap is oozing from many of these branches. What is the cause of this trouble and what can I do for it, if anything?—J. A. W., Kentucky.

ANSWER: In all probability your trees are infested with fruit tree bark beetles. They cause damage of the kind you describe. The insect makes one hole when the small adult beetle comes out of the bark and another when it later re-enters the bark to lay eggs. The young larvae which hatch from the eggs burrow beneath the bark and into the sapwood. About a month is required for each generation, and in your state there is usually about three generations a year.

Fruit tree bark beetles are worse on trees which are in a weak condition due to low fertility or damage from some other insect or disease.

One of the best methods of combating the beetles is to put the trees into vigorous condition by means of good cultivation, fertilization and spraying for other insects and diseases. All dead and diseased wood should be pruned out and burned. Trees that are in vigorous condition are rarely infested seriously by fruit tree bark beetles. In the event that infestation has become unusually severe, the trees should first be cut back severely and then fertilized and cultivated liberally. Such treatment will stimulate growth and help the trees to overcome the damage. A thick coat of a good whitewash, to which is added a handful of table salt to each bucketful of wash, should be applied at least three times during the season, once in the early spring, once in mid-summer and once in the fall. This wash will practically prevent the laying of additional eggs.

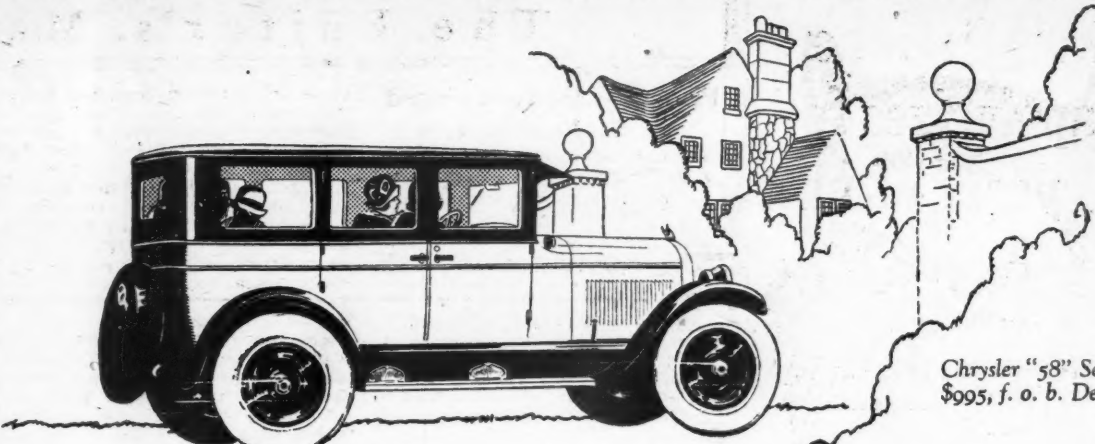
Killing Dandelions by Spraying

AMERICAN FRUIT GROWER MAGAZINE: Dandelions are quite thick in my lawn and I am anxious to eradicate them. Will it be necessary to plow up the lawn and replant it, or is there some chemical I can use to eradicate the dandelions?—K. E. L., Ohio.

ANSWER: You can probably eradicate the dandelions by spraying your lawn four or five times with iron sulphate solution. Put on the first application just before the blossoming period and follow with two additional applications at intervals of three to four weeks. Two more applications should be put on in the fall to insure the eradication of straggling plants which escaped the early treatments.

The iron sulphate should be dissolved at the rate of one and one-half to two pounds to a gallon of water. One gallon should be applied to about every 350 square feet of lawn. A very fine nozzle should be used for application, as it is important to spread the material over the plants in as fine a mist as possible.

TWO INSECT schools were held in Indiana recently that were apparently the first of their kind. One school was conducted at Vincennes on February 25 and 26 and the second at Evansville on February 27. The schools were conducted by Dr. J. J. Davis, State Entomologist of the Agricultural Experiment Station, and by B. A. Porter, Federal Entomologist, acting in co-operation with the local farm bureau and county agents. Marked interest was shown in the schools. There was an attendance of 150 growers at Vincennes and of 60 at Evansville. Lectures and demonstrations were given on the fundamentals of insect control, especially of those serious on fruit.



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CHRYSLER IMPERIAL "80"—Phaeton, \$2645; Roadster (wire wheels standard equipment; wood wheels optional), \$2885; Coupe, four-passenger, \$3195; Sedan, five-passenger, \$3395; Sedan, seven-passenger, \$3595; Sedan—limousine, \$3695.

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All Chrysler models are protected against theft by the Fedco patented car numbering system, exclusive with Chrysler, which cannot be counterfeited and cannot be altered or removed without conclusive evidence of tampering.

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A pipe smoker apologizes for years of hate

Reading, Pa.,
August 29, 1925.

Larus & Bro. Co.,
Richmond, Va.

Dear Sirs:

For years I have read your advertisements and testimonials and laughed at them—until last month. I am now writing this letter as an apology to Larus & Brother Co.

Prejudiced many years ago when I first started to smoke a pipe against Edgeworth because a hated enemy of mine was a constant smoker of it, I refused to fill any pipe of mine with this tobacco.

I smoked almost every kind of tobacco I could buy but your brand. I was what I call a "gypsy smoker." Sometimes I would find satisfaction for a while, but always the tastes of tobaccos would give me repulsive mouth odors. With some, my mouth would have the feeling that it was the uncleanest thing on earth. Some tobaccos even blistered my tongue.

Price was no object. I had paid as much as eight dollars a pound for my smoking mixtures, but I could find no contentment.

Some time ago I was without my pouch and borrowed a pipe-load from an acquaintance, not asking what kind he smoked. We parted and I lit up. I enjoyed it so much I could not wait until I could ask him what kind it was. It was Edgeworth. I was disappointed, but not too narrow-minded to try a can for myself. For a month now, I have hesitated in writing you, in hopes (again I apologize) that I could find fault with it. But I can't.

At last I am satisfied and I am willing to forget that feeling of animosity towards the man who first prejudiced me against your peerless smoke, for I see now that he had more common sense than I.

So I apologize and thank you for doing something I thought could not be done—giving me a smoke I could really enjoy at all times. We are friends for life.

Sincerely yours,

H. Roth Newpher.

Let us send you free samples of Edgeworth so that you may put it to the pipe test. If you like the samples, you'll like Edgeworth wherever and whenever you buy it, for it never changes in quality. Write your name and address to Larus & Brother Company, 13-P South 21st Street, Richmond, Va.

On your radio—tune in on WEVA,
Richmond, Va.—the Edgeworth station.
Wave length 256 meters.

Markets and Marketing

SOME time ago we expressed the view that there are too many grocery stores to permit operation on a low overhead basis. Paul Lindlay in *The Co-operator* of Chicago gives some detailed figures bearing on this point.

Analyzing the conditions in a given county, Mr. Lindlay found that there were 90 food retailers in business. They serve an average of 280 people, or 55½ families. The average food store serves 333 1/3 persons, according to Mr. Lindlay.

With such a small number of persons served by each store, how can the average store operate on a low overhead basis? It cannot do so. If the store is to survive at all, the profits must be made high enough so that the costs can be met and a reasonable net profit made. Of course, business competition and the law of supply and demand will exercise some influence in this regard, but the presence of so many dealers in the business will also have an influence in keeping overhead costs high and the spread between producer and consumer larger than it should be. If we could have fewer retail handlers of food, the overhead expense of conducting such stores could be reduced, to the advantage of both producer and consumer.

THE WHOLESALE prices collected by the Bureau of Labor Statistics for January, 1926, show the following index numbers for the more important groups of commodities as compared with a figure of 100 for the year 1913:

Farm products.....	151.8
Clothing materials.....	185.5
Fuels.....	176.5
Metals and metal products.....	123.9
Building materials.....	177.9
Chemicals and drugs.....	133.2
House furnishing goods.....	164.9
Average of all commodities.....	156.0

These comparisons show that with the exception of metals, chemicals and drugs the prices of agricultural products are lower relatively than the prices of other groups of commodities. Of 404 commodities investigated during January, the bureau found that increases occurred during the month in 100 instances and decreases in 133 instances. In 171 cases no changes in price were reported.

MARKETING officials of West Virginia believe that the state uses shipping point inspection for a larger proportion of its apples than any other state. During 1925, 60 per cent of all of the carlot barreled apple shipments were inspected. A total of 1091 cars were inspected, and in not a single case was the certificate of inspection reversed by reinspection at receiving markets.

There is a favorable attitude on the part of growers toward this service, in the opinion of marketing officials, and it is expected that the demand for the service will be increased the coming season. The state department of agriculture is co-operating with the United States Department of Agriculture and the Agricultural Extension Service of West Virginia in rendering this service.

THE LATEST estimate of citrus production for Florida places the output at 14,000,000 boxes for the season, which is 5,200,000 boxes below the output of last year.

Shipments of tangerines and oranges

are estimated at 8,500,000 boxes, or 2,500,000 boxes below the shipments of last year. Grapefruit shipments are estimated at 5,500,000 boxes, which represents a decrease of 2,700,000 boxes from last year's shipments. The above estimate places the orange shipments at 2,200,000 boxes below the December estimate, and grapefruit shipments at 800,000 boxes less.

The tremendous reduction in estimates has been due in part to the setting of a lighter crop of fruit than was estimated earlier in the season and also to serious reduction in acreage due to subdivision. An unofficial report states that 25,000 acres of citrus groves have been wiped out as a result of subdivision.

A RECENT estimate places the California orange crop at 20,400,000 boxes as compared with 18,100,000 boxes produced last year. The production of grapefruit is estimated at 400,000 boxes for the present season as compared with 387,000 boxes last year.

THE REPORT of the publicity committee of the National Apple Week Association, which was recently issued, shows that during last year numerous companies and individuals contributed to the campaign to increase apple consumption, both in the way of finances and other forms of help. The financial report shows that a total of \$6558 was received from various sources, which were named in detail.

THE UNITED States Department of Labor has recently issued some interesting statistics regarding changes in cost of living in different periods since 1914. Comparing the results in 19 leading cities, it is shown that the cost of living increased from December, 1914, to December, 1925, from 56.9 per cent to 88.2 per cent in the different cities. The greatest increase, 88.2 per cent, occurred in Detroit, and the lowest increase, 56.9 per cent, occurred in Portland, Ore.

The peak year in living costs was 1920, as most people are aware. The decrease from June, 1920, to June, 1925, in cost of living, ranged from 12 per cent to 22.2 per cent in the different cities. The smallest decrease of 12 per cent occurred in Los Angeles, Calif., while the largest decrease of 22.2 per cent occurred in Savannah, Ga. During the year 1925, the cost of living increased in all 19 cities. From December, 1924, to December, 1925, the percentage of increase ranged from 0.7 per cent in Portland, Ore., to 6.6 per cent in Jacksonville, Fla. Most of the decreases took place during the latter half of 1925.

THE CANADIAN fruit crop for 1925 was worth over \$25,000,000, according to William R. Motherwell, Dominion Minister of Agriculture. The apple crop constituted about 80 per cent of the dominion's fruit production. The output amounted to 3,580,770 barrels, having a value of \$20,057,417. The average price realized per barrel was \$5.60. The grape crop reached 25,000,000 pounds and stood second with a value of \$1,750,000. Strawberries were third in output with a production of 8,070,000 quarts, valued at \$1,453,000. The peach crop was valued at \$547,772,

the cherry crop at \$409,210 and the raspberry crop at \$401,690.

Ontario produced about 40 per cent of the fruits of the dominion. Most of the fruit came from the Niagara peninsula. British Columbia ranked second with a crop worth about \$7,849,227. Fruit growing in British Columbia has been increasing in extent and some persons feel that this province will soon lead all others in Canada. Nova Scotia ranked third with a fruit crop worth \$4,076,389.

The dominion exported about 2,000,000 barrels of apples during the year, 50 per cent of which went to the United Kingdom. The high quality of Canadian fruit is establishing a strong demand for it in the world market.

THE DEPARTMENT of Agricultural Economics of the Maine Agricultural Experiment Station has completed a study of apple production for the state. Data have been collected on 930 farms producing apples and the results are now being tabulated. Prof. C. H. Merchant, who has this work in charge, is devoting half of his time to the project.

The Maine Agricultural College is giving a course in statistics for advanced students and another course in co-operative marketing for juniors and seniors.

THE EXPORT duty on American apples shipped into Germany has been reduced to 33 cents per box and \$1.09 per barrel. The former duty was 57 cents per box and \$1.87 per barrel.

Germany recently concluded a treaty with Italy whereby the duty on Italian apples imported into Germany was reduced as above noted. The commercial treaty between the United States and Germany specifies that this country is to enjoy duties on the products shipped into Germany equal to those enjoyed by any other nation. A number of other nations have a similar understanding with Germany and will enjoy similar reductions. Countries which do not have a similar understanding are France, Australia and Canada. Imports from these countries into Germany are therefore subject to the general schedule of duties prescribed in the new German tariff, which became effective on October 1, 1925. These rates are 71 cents per box and \$2.33 per barrel, or 38 cents a box and \$1.24 a barrel higher than the rates which will be paid by other countries.

THE BOXED apple demand is reported to be weak in British markets. Barreled stock is moving only at a moderate rate. The publicity following the recent court decision regarding apples sprayed with arsenicals has had a noticeable effect on the demand for boxed fruit. Prices for boxed apples decreased to an appreciable extent, and some varieties of barreled apples also showed depreciation.

THE PRODUCTION of fruits in Canada was smaller in 1924 by a value of \$8,902,912 than in 1923. The following table gives some interesting figures regarding the production of important fruits during 1923 and 1924:

	1924.	Value.
Apples, bbls.	3,247,270	\$18,777,667
Pears, bu.	196,809	471,924
Strawberries, qts.	6,532,000	1,398,910
	1923.	Value.
Apples, bbls.	4,493,182	\$24,489,305
Pears, bu.	227,335	550,587
Strawberries, qts.	8,652,200	1,513,230

THE ARIZONA Citrus Growers, Phoenix, Ariz., shipped 1500 individual Christmas boxes for the holiday trade. These boxes, which were filled with oranges and grapefruits, were packed carefully so that they would be a good advertisement for the Salt River Valley.

The exchange shipped 161 cars of fruit previous to the holidays as compared with 129 cars shipped during the same period last year. Total

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shipments in 1924-25 amounted to 186 cars. In addition, a sufficient quantity was shipped in less than carloads to bring the total shipments to approximately 250 cars. It is expected that the total 1925-26 shipments will amount to about 350 carloads. There are 96 members in the association.

RECENT recommendations of the United States Department of Agriculture for the season of 1926 include the following recommendations in regard to the fruit industry:

"Further plantings of citrus fruit should not be made without serious consideration, inasmuch as, barring freezes, a very material increase in production is likely. A general improvement in the apple industry may be expected. New plantings of commercial peach orchards are inadvisable except under the most favorable conditions of production and marketing. New planting of grapes is undesirable."

THE PRUNE crop of Yugoslavia totaled 80,000 net tons for the season of 1925. Of this quantity, 33,069 net tons were used for the making of prune brandy, 40,784 tons were exported to other countries, 2205 tons were used in domestic consumption, and a surplus of 4409 tons was left on hand December 31, 1925.

Of the export shipments, 22,046 tons were shipped to Germany, 5511 to Austria, 5511 to Czechoslovakia, 3858 tons to Scandinavia, 2205 tons to France, and 551 tons each to Italy, Switzerland and Holland.

S. B. MOOMAW, who is thoroughly familiar with the problems in export marketing of fruits, has made some interesting statements in the January issue of the *Anglo-American Trade of London*. Mr. Moomaw foresees the prospect of important changes in fruit exporting conditions. He thinks that the changes will increase consumption of fruits in Europe, but he also thinks that the increased consumption will benefit fruit growers in Great Britain and its possessions to a greater extent than it will benefit those in other countries. The British government is planning to spend 1,000,000 pounds annually in advertising fruits, and an effort will be made to create preferences for Empire grown fruits.

It is unlikely that a tariff will be placed on American importations. In all probability the Empire will seek to benefit growers in its possessions through a centralized distribution and marketing service supervised by government officials.

Mr. Moomaw further states that American growers, in order to properly compete with the new conditions, should establish a centralized system covering all important markets in Great Britain which would not be interested in showing partiality toward any particular market. It is only by such means that American fruit growers will be able to secure the fullest advantage from the increased consumption that is likely to result from the assistance that is to be given by the British government.

ONE OF the great advantages derived from co-operative marketing, which means consolidated, centralized control of the growers' crops, is the ability of such an organization to accomplish things that would be impossible to accomplish by individuals working separately. For instance, the walnut growers' marketing association established a plant to make charcoal out of walnut shells from their cracking plant, and the first year of operation were able to turn to the growers \$100,000 for what would otherwise have been worthless refuse. That same marketing organization has put thousands of dollars into experimental work for the benefit of the growers; and they have done many other things to benefit the industry that nothing short of unification and centralization of the product would have enabled them to do.—*National Pecan Growers' Exchange*.

Monthly Market Review

THE FOLLOWING summary of the fruit marketing situation was furnished by the United States Bureau of Agricultural Economics on March 8:

"Spring began with a number of small setbacks in prices. Dealers lose more than farmers when produce sells downward at this time of year, but many farmers have part of the crop on hand, including such stored crops as potatoes, cabbage, onions, and apples, and there is the increasing production of spring truck crops in the South. Shipments of fruits and vegetables have been 10 to 15 per cent below the early spring season of last year. Potatoes, celery, cabbage and citrus fruits have been coming at only about three-fourths the volume of a year ago. Onions, spinach and lettuce have been arriving in about the same quantity, and apple receipts are nearly double.

Apples Draggy

Very heavy shipments from the Northwest and western New York are directly responsible for the draggy apple markets prevailing through the greater part of the season. Washington, New York and Idaho shipped more than half the carlot supply this season. Idaho rises to third place for the time being. These states shipped 50 per cent more apples than last season, upsetting the calculations of those who bought for storage. Receipts are still rather heavy for the time of year. Prices are mostly two-thirds to three-fourths of the prevailing range a year ago; less than that for some varieties and grades, although a few popular varieties like Delicious and McIntosh have advanced to about the price level of last season. The encouraging general feature is the good demand, even though retail prices have not always gone down as fast as suggested by the action of the wholesale market. Foreign trade picked up a little, especially for barreled apples, with the opening of the spring season, but the general level in British markets is a little lower than last season.

Strawberry Shipments Light

Shipments of Florida strawberries have been very light owing to reduced acreage and poor yield. Prices have been considerably higher than last season. Supplies of strawberries should rapidly increase with the maturity of the large crop in Louisiana.

THE FRUIT industry has been growing rapidly in western Australia, according to E. G. Babbitt, American trade commissioner located at Sydney, Australia. The season of 1924-25 was a successful one. The crop was not as large as in 1923, but the quality was good and the prices obtained in England and elsewhere were higher than in the record year 1923.

The four principal fruits produced in western Australia are apples, grapes, oranges and pears. The areas devoted to them are: apples, 9672 acres; grapes, 5235 acres; oranges and mandarines, 3423 acres; and pears, 1308 acres.

The western Australia state fruit advisory board has found that during 1925 it cost three shillings 11 pence (about 94 cents) to produce a bushel of apples and nine shillings one-half penny (approximately \$2.17) to place the bushel on the English market, making a total outlay of 12 shillings 11½ pence (about \$3.11) per bushel. During 1924 there were shipped from western Australia 347,342 bushels of apples, 25,974 cases of grapes, 16,886 cases of pears, and 12,580 cases of oranges. Nearly three-fourths of the exports go to London.

ARECENT report shows that chain stores did a business last year amounting to \$2,800,000,000, which is a little more than eight per cent of the retail trade of the country. The number of chain stores is placed at 3.7 per cent of the total number of retail stores. There are 2000 separate chain store organizations and these control about 60,000 stores.



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BIGGER orchard profits go hand in hand with the use of Cletrac. Abundant power, easy control and a remarkable ability to work under low branches and close up to the trees, makes it a simple matter for Cletrac owners to do every orchard job thoroughly—with the result that trees are healthier and yields far bigger. For economical operation—thorough cultivation—and all 'round efficiency these dependable machines are without equal in orchard work.

Greater Power—Sure Traction—Light Tread and Easy Handling

are four big reasons why Cletrac Crawler Tractors are the first choice of progressive orchardists. Add to these Cletrac's outstanding ability to work on hill-sides and in tight places—to travel steadily along over any kind of footing—all at bed-rock operating cost—and you will see why it is to your best interests to make this tractor your own.



As an ever ready power plant for any kind of work on the farm or in the orchard, Cletrac holds first place. For plowing, discing, harrowing, seeding—for reaping, harvesting, shredding, feed grinding—and all the odd jobs about the place, Cletrac delivers abundant, **usable** power at lowest cost.

Write us today for complete descriptions of Model W and Model K. We'll also send you the name of a Cletrac dealer who will demonstrate for you how Cletrac saves time and money in the orchard and on the farm.

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If your motor is sluggish and lacks power in rough going, install a complete set of dependable Champion Spark Plugs and note the improvement. Your car will have new power, speed and acceleration. It is because motorists the world over know this that Champions are outselling two to one.

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THIRTY-FIVE federations, made up of 1907 local units engaged in the co-operative marketing of farm products, had a total membership in excess of 210,000 at the close of 1925. Twenty-two federations with 850 units marketing fruits and vegetables reported 55,110 members, and seven federations with 846 units, engaged in the handling of dairy products, reported 112,625 members, according to a survey just completed. The largest federation reported 447 units with 73,000 members. It is located in Minnesota and is engaged in the merchandising of the butter produced in the creameries operated by the local units. The second largest federation was a Wisconsin dairy marketing association with 128 local units and 24,000 members.

The largest of the federations marketing fruits and vegetables was the California Fruit Growers' Exchange which handles oranges and lemons. Its 204 locals reported a total membership of approximately 12,000. A Michigan enterprise marketing white potatoes reported 72 local units and 7800 members. A California federation handling deciduous fruits was credited with 129 units and 7000 members, and a federation in Florida selling citrus fruit reported 98 units and 6000 members.

The 35 functioning federations from which reports were obtained, are located in 18 states. Five of the federations have headquarters in California, four in New York, three each in Michigan and Washington, and two each in Minnesota, Wisconsin, Florida, Oregon, Vermont and Ohio. The states with one federation reporting from each are Mississippi, Indiana, Colorado, West Virginia, Arkansas, Alabama, Illinois and Maine.

The two federations credited to Minnesota reported 464 units with 95,000 members; two federations reporting from Wisconsin had 338 units and 29,500 members; five federations in California, 426 units and 26,700 members; and three federations in Michigan, 179 units with 22,100 members.

Sixty-eight per cent of the total membership for all the organizations is in five federations with 883 units.

The federated form of co-operative marketing is over 30 years old. In 1895 after several years of effort by associations of orange growers, the Southern California Fruit Exchange was created to serve seven district associations. In 1905 the name of the organization was changed to the California Fruit Growers' Exchange, that the name might more nearly describe the territory being served.

It is estimated that the membership of the two federations functioned in 1900 was 1800; of the three federations in 1905, 3700; of the six in 1910, 9400; of the 10 in 1915, 15,955; of the 19 in 1920, 61,550; and of the 35 in 1925, 210,325. Up to 1918 there had been only a slow steady growth in federation membership, but since that year the increase has been marked.

ONE OF the serious weaknesses of many agricultural co-operatives is the tendency of members of boards of directors to shirk responsibility in the matter of management.

"Too frequently," says the United States Department of Agriculture, "the individual member looks upon his elevation to the office of director merely as a recognition of his standing in the community. Such an attitude is unfortunate and until every director comes to feel that he has

accepted a trusteeship for the successful conduct of the business, co-operative enterprises will fail of attaining the full measure of success they wish to achieve."

This trusteeship, says the department, obligates every director to inform himself thoroughly respecting the operations of the business with which he has become vitally connected. In addition he will need to understand fully the broader principles upon a thorough working knowledge of which depends, to a large extent, the degree of success and progress of the business.

"If lack of interest is a weakness," says a department economist, "the wrong kind of interest is equally bad. Too frequently one finds the board interfering instead of directing. It is the duty of the board to formulate policies and to see that these policies are carried out by the executives. Dictation by the board of the petty detail of day to day operation is not 'formulating policies.' It is interference. Such interference can only result in unstable and unsatisfactory management."

Probably the most frequent cause of unwise management, he points out, is a lack of essential facts, or if these be at hand, an unwillingness to face the facts. To the extent that the board of directors makes a real effort to understand the demand for its products, and to formulate price and merchandising policies on the basis of all the facts, rather than on the basis of mere opinion, he says, will its activities contribute to whatever measure of success is achieved.

THE CO-OPERATIVE Farmers' Exchange, Inc., of Weld county, Colorado, enjoined one of its members from selling products outside the association. Notwithstanding the injunction issued against him, he sold some products to third persons, and the exchange instituted proceedings against him for violating the injunction. He failed to give a bond to insure his appearance, and on account of this he was placed in the Weld county jail. He then obtained a writ of habeas corpus from the Supreme Court, directed to the sheriff of Weld county, calling upon that officer to show why the member should not be released from jail. The Supreme Court in hearing the case held that the proceedings had been regular. The Supreme Court called attention to the fact that subsequent to the issuance of the writ the law under which the exchange was organized had been held valid by it in another court case. The member was therefore obliged to serve his jail sentence.

THE ILLINOIS Fruit Growers' Exchange held its annual meeting at Centralia Ill., on January 26. Delegates were present from the 35 shipping points of the exchange and a harmonious meeting resulted.

The reports of General Manager A. B. Leeper and Sales Manager J. O. Lawrence showed that during 1925 the exchange handled a total of 476 cars of products, 48 cars of which were shipped in less than carlot quantities by express. The products sold brought in returns of over \$300,000. The business was conducted at a cost of eight per cent as compared with the cost of 9.7 per cent in 1924.

The products were shipped to 105 markets in 25 states. The Illinois brand of products was shipped to 51 new

APPLY Nitrate & Lime at the Same Time AT ONE COST

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contains 15.5 per cent Nitrogen, equal to 18.8 per cent Ammonia, and about 28 per cent Lime.

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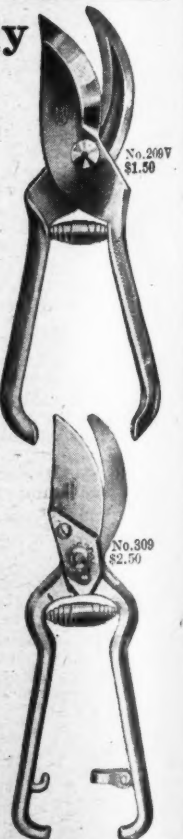
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A Powerful Motor Cultivator and Lawnmower for Gardens, Florists, Truckers, Nurseries, Berrymen, Suburbanites, Estates, Parks, Cemeteries.
Does 4 Men's Work.
Discs, Harrows, Seeds, Cultivators, Run Belt Machinery & Lawnmower. Catalog Free.
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Fine materials, expert workmanship, and convenience distinguish Wiss Pruning Shears. They cut easier and last longer than ordinary shears selling at the same price. Be sure to ask for WISS.

No. 200V. A one-piece tool, with die-pressed handles and hammer-forged blade. Extra wide bevel, insuring easy cutting. Volute steel springs. Non-pinch handles. \$1.50.

No. 300, a new pattern, hammer forged, and tempered to hold its edge for a long time. Unbreakable frame, non-pinch handles. Blade removable for sharpening or replacement. \$2.50. 7 styles from \$1.50 to \$4.25.



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markets the past season. Most of the shipments were made during August, September and October. The largest number of cars was shipped to markets in Illinois. Wisconsin, Minnesota and Tennessee ranked next in order in the number of cars taken. Apples constituted the largest valuation of products handled, with strawberries, peaches and pears following in the order named.

A rather interesting discussion took place with reference to plans for 1926. There has been little winter killing of peach buds in southern Illinois and the prospects are good for a large crop of peaches, provided damage is escaped from late spring frosts. Most of those present believed that there would be a rush on the part of many growers to join the exchange as soon as a peach crop was in prospect. The exchange officials felt that it would be unwise to increase the tonnage too rapidly, and they felt also that there should be rather careful selection of the tonnage. After discussing the question fully, it was voted to use extreme discretion in selecting the growers who make application and also to limit the tonnage of peaches to approximately 1500 cars for the coming season.

THE HUDSON River Fruit Exchange, at Milton, N. Y., had one of its most successful years in 1925. Crops were short in the section, but the exchange handled the larger part, and sold for a greater number of members than before. It has established the "Hudsonia" brand, increased its f. o. b. sales at home, added to its export trade, and is developing a market west of the Mississippi for some of its products. The total sales for the year were \$408,954.77 against \$29,910.20 in 1912. The total income of the association for the year was \$44,713.27 and the expense \$39,584.34, leaving a net profit of \$5,128.93.

Starting with a capital of \$8180, it now has resources of \$57,801.87, including a surplus of \$42,780.03.

It has a factory producing baskets for its members at a saving. It also has a coöperage to supply its members with barrels at a substantial saving.

These fruit growers know how to organize a co-operative association. They have a board to direct its affairs. They found a competent general manager and hired him to do the business. He is not a director or officer. They see that the business is efficiently handled. Every penny of income and outgo is accounted for. It refutes the theory that farmers lack ability to manage the business of their own associations.

George Hildebrand is the General Manager, and the board consists of J. W. Clarke, President; C. C. DuMond, Vice-President; C. J. Hepworth, Treasurer; W. P. Garmany, Secretary; J. R. Conway, L. W. Craft, W. S. Betts, Directors.—*Rural New Yorker*.

THE ADVERTISING budget of the California Fruit Growers' Exchange for 1925-26 is divided into three main groups, as follows: consumer advertising, 70.3 per cent; trade work, 24.3 per cent; and administration, 5.4 per cent. It calls for an expenditure in behalf of oranges and grapefruit of \$685,984 and for lemons of \$383,855. An assessment of four and one-half cents a box is to be made on oranges and grapefruit and of seven cents on lemons, the same as in the previous two seasons.

Most of the advertising appropriation will be spent in newspaper advertising, posters and educational promotion. It is estimated that the advertising will reach a total circulation of about 566,000,000. Newspaper advertising will be placed in 12 magazines having a large and general circulation.

THE CALIFORNIA Pear Growers' Association recently closed a series of eight meetings throughout Cali-

fornia at which various questions pertaining to the growing and marketing of pears received consideration. The national advertising campaign proposed for 1926 received especial consideration. This subject was handled by Harry Hayward, formerly dean of the Delaware Agricultural College and at present Chief of the Division of Agriculture for N. W. Ayer and Son, advertising agents.

At present California produces 21 per cent of the Bartlett pears grown in the United States. New York produces 15 per cent and ranks second. No other state produces more than seven per cent. The season for California Bartletts lasts from about the first week in July to the first of September. The necessity of selling the entire crop in such a short time makes

the problem of marketing a particularly vital one.

ONE THOUSAND FIFTY-SIX co-operative associations, of the 1384 chartered in New York state from 1917 to 1925, transacted business in excess of \$92,000,000 for the crop year of 1924, according to a summary issued recently by the commissioner of the New York State Department of Farms and Markets. Three hundred twenty-eight associations of the number chartered were inactive or out of business in 1924. Activities of these 1056 associations ranged from marketing more than 30 kinds of farm products to carrying on co-operative restaurants and building co-operative apartments. The farm products handled included

fruits, honey, maple products, teasels, tobacco, vegetables, wool and livestock.

The dairy industry accounts for a large share of the business. Consumers' organizations have also been active. One such group in New York City now operates four large cafeterias and a laundry.

The first co-operative law was enacted in New York in 1914; but very few associations were formed under it. At the beginning of 1918 there were but 17 active co-operatives listed by the Department of Farms and Markets. New legislation stimulated the movement and since that time more than 1350 charters have been granted to groups to co-operate for nearly every purpose permitted under the law.

A Promise Fulfilled

To carry through one of the greatest expansion programs in automobile history, Dodge Brothers, Inc. invested more than \$10,000,000 in new buildings and advanced new equipment.

Remarkable new mechanical processes were perfected, making it possible, in many instances, for one machine to do the work formerly done by six, eight and ten machines—and do it better.

Making it possible, too, for one man more quickly and accurately to do the work of many. And clearing large areas of factory space for greater output.

Tremendous increases in production have followed. Vast economies have followed. Finer precision in craftsmanship has followed. Vital improvements in Dodge Brothers Motor Car have followed—and, as promised, astonishingly low new prices made possible by these gigantic developments.

Your share in this great investment is the money you save by purchasing, at the lowest price, the finest vehicle ever produced by Dodge Brothers.

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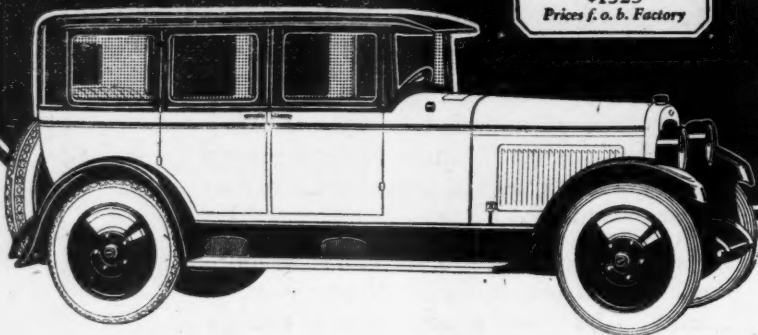
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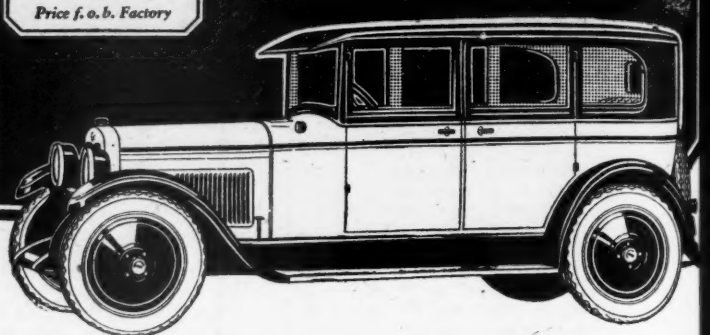
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Special Six 4-Door Sedan
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Advanced Six 4-Door Sedan
\$1525
Prices f. o. b. Factory



Ajax Six 4-Door Sedan
\$995
Another Nash Success
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Here's Power, Comfort and Value in Extreme Degree

Rapidly increasing sales of Nash Special Six, Advanced Six, and Ajax Six models to farmers is due to the way Nash has engineered these cars to meet the severe demands of rural travel.

Their exceptional power quickly reveals itself in the smooth ease with which they pull thru heavy going. And the chassis is built with a special reinforced ruggedness and rigidity to withstand the twisting punishment of rutted roads.

Nash has devoted particular care to providing the

greatest possible seat and leg space with an eye to the fact that often a car must carry a load of goods as well as passengers.

Clearly of superior quality in construction, performance and equipment, these Nash-Ajax models at their low prices re-emphasize the leadership Nash enjoys in giving greater value.

There are 16 models in the Nash-Ajax line and prices f. o. b. factory extend from \$865 to \$2090, with 4-wheel brakes, full balloon tires, and five disc wheels, included at no extra cost.

(3277)

Largest Lady Apple Orchard

By Paul J. Pirmann

COL. CHARLES C. BELL of Boonville, Mo., owner of the largest Lady apple orchard in the world, although 77 years old, is always on the lookout for innovations and this year he will begin the raising of bees as a means of insuring better pollination for his apples.

He recently attended Farmers' Week at the University of Missouri and made a thorough study of bees and their relation to the pollination of fruit, so that he might understand better the new project and know the correct way of handling it successfully.

Col. Bell was first president of the International Apple Growers' Association. He stands alone among the apple growers of Missouri, in that he is the only one who has devoted all of his time to the development of the Lady apple.

The Boonville man first discovered this apple, a small and very decorative fruit, some 40 years ago on a farm near Rocheport. He was at that time an apple buyer, and in order to get the full output of the Rocheport orchard, it was necessary for him to buy the Lady apples with the rest of the crop. The first year he sent a few of them in every carload of fruit which left his packing house.

To his surprise, Col. Bell found that the Lady apple brought several times as much in the eastern markets as the regular Ben Davis and Jonathan apples. The following year he purchased the Rocheport orchard and began shipping the small apples

exclusively to Philadelphia and New York.

In 1909 he began the growing of them on his Cooper county farm, by setting out 92 trees. Since this he has each year increased his orchard until now he has 80 acres of this variety, with some 1300 trees bearing.

Col. Bell, despite his advanced age, is still active in state and national horticultural circles and personally superintends the packing of each carload of apples which leaves his orchard.

(Editor's Note.—This article is presented because of its interest. While Col. Bell no doubt has been making money by growing Lady apples, we doubt if there is a sufficient market for these apples to warrant large numbers of growers in planting them. We hope the article will not have the effect of encouraging extensive planting of the Lady apple.)

New Method for Control of Crown Gall Developed

A NEW method for the control of a crown gall in the apple nursery has been found by the United States Department of Agriculture after a number of years of experimental work. Department Circular No. 376, "A Method for the Control of Crown Gall in the Apple Nursery," by M. B. Waite and E. R. Siegler, has just been published to give the information to nurserymen and others interested in the propagation and growing of root-grafted apple trees.

The problem of crown gall in nurseries is a very serious one. It is not uncommon for the nurseryman to find 25 to 50 per cent of his trees infected at digging time. Experimental tests of the new method have

shown that the percentage of infection can be materially reduced.

The disease or gall which usually forms about or near the graft is caused by a germ which is easily killed by germicides when it can be reached. For a number of years the department has recommended the use of a formaldehyde solution as a dip for the apple stocks and scions before grafting, as a means of controlling crown gall. It has proved of some value in the control of the disease. In the past three years one of the organic-mercury compounds has also been tested as a dip and has proved distinctly more efficacious than the formaldehyde-solution treatment. It also proved to be non-injurious to the apple grafts.

In the experiments of 1925 in which the organic-mercury treatment was given to 2619 grafts representing a number of different varieties, only 6.1 per cent of the trees were found to have galls, both large and small, as compared to 32.6 per cent on the same number of untreated grafts which were used as checks. The grafts used in these experiments were wrapped either with raffia or a cheap grade of muslin.

The best practice to follow is to inspect critically the seedling stocks before using them for grafting and to discard and burn all the obviously infected ones. The supposedly clean seedlings and also the scions should be dipped, uncut, in the organic-mercury solution consisting of one part of hydroxymercurichlorophenol to 400 parts of water (approximately at the

There are several organic mercury germicides, commonly found on the market under trade names, containing this substance as an active ingredient.

rate of one ounce to three gallons) and allowed to remain for 10 minutes. After the grafts are made and carefully wrapped they should be dipped in a fresh solution of the same kind for about five seconds. They should be stored in a cool place and just before planting dipped again in a fresh solution for five seconds.

A copy of the circular may be secured as long as the supply lasts by writing to the United States Department of Agriculture, Washington, D. C.

Spray for Apple Aphids from the Ground

TESTS conducted by the New York Agricultural Experiment Station show that spraying from the top of the spray tank is ineffective in controlling aphids on apple trees. The insects are most numerous on the lower branches of the trees and it is impossible to cover these branches thoroughly from the top of the tank.

When the spraying is done from the ground at the same time and under similar conditions, practically complete control of the apple aphids results.

In the station orchards, it is the practice to spray for apple aphids from the ground. A long hose is provided so that the operator can reach all parts of the tree easily. A pressure of 200 pounds is maintained at the spray tank. If the man handling the nozzle moves about and takes care to thoroughly cover every branch within his reach, the aphids can be controlled quite satisfactorily. Further details are contained in Station Bulletin 487 of the Agricultural Experiment Station, Geneva, N. Y.

Publications of Interest to Fruit Growers

THE FOLLOWING are some of the publications of interest to fruit growers that were received during the past month. Distribution of some of them may be limited to the state in which published, but we believe that in most cases growers can secure copies free of charge by addressing a request to the institute publishing them.

Control of the California Ground Squirrel, by Joseph Dixon. Circular 296, Agricultural Experiment Station, Berkeley, Calif.

Pollination of the Sweet Cherry, by Warren P. Tufts and Guy L. Philp. Bulletin 385, Agricultural Experiment Station, Berkeley, Calif.

Pruning Bearing Deciduous Fruit Trees, by Warren P. Tufts. Bulletin 386, Agricultural Experiment Station, Berkeley, Calif.

Water and Plumbing Systems for Farm Homes, by E. W. Lehmann and F. P. Hanson. Circular 303, Agricultural Experiment Station, Urbana, Ill.

Experiments on Resistance of Apple Roots to Low Temperatures, by G. F. Potter. Technical Bulletin 27, Agricultural Experiment Station, Durham, N. H.

Some Chemical Constituents of Fruit Spurs Associated with Blossom Bud Formation in the Baldwin Apple, by H. R. Kraybill, G. F. Potter, S. W. Wentworth, P. T. Blood and J. T. Sullivan. Technical Bulletin 29, Agricultural Experiment Station, Durham, N. H.

Floors—Their Finish and Care, by Mrs. Marion C. Bell. Extension Bulletin 49, New Jersey State College of Agriculture, New Brunswick, N. J.

Spray Calendar for Apples and Quinces. Circular 180, Agricultural Experiment Station, New Brunswick, N. J.

Spray Calendar for Peaches. Circular 181, Agricultural Experiment Station, New Brunswick, N. J.

Spray Calendar for Plums and Cherries. Circular 182, Agricultural Experiment Station, New Brunswick, N. J.

Spray Calendar for Grapes. Circular 183, Agricultural Experiment Station, New Brunswick, N. J.

The Injurious Effect of Submergence on the Cranberry Plant, by S. Wakabayashi. Bulletin 420, Agricultural Experiment Station, New Brunswick, N. J.

Control Methods for Peach Insects, by C. H. Brannon. Extension Circular 153, Agricultural Extension Service, Raleigh, N. C.

Blooming Period and Yield of Apples, by C. W. Ellenwood. Bulletin 385, Agricultural Experiment Station, Wooster, Ohio.

Fruit Varieties in Ohio (1), by J. H. Gourley and C. W. Ellenwood. Bulletin 391, Agricultural Experiment Station, Wooster, Ohio.

Trapping Moles for Market, by George F. Sykes. Extension Bulletin 158, Oregon Extension Service, Corvallis, Ore.

The Farm Orchard, by A. E. Schilleter. Bulletin 74, Clemson Extension Service, Clemson College, S. C.

Apple Disease Studies in Northern Virginia, by F. J. Schneiderhan. Bulletin 245, Agricultural Experiment Station, Blacksburg, Va.

A Method for the Control of Crown Gall in the Apple Nursery, by M. B. Waite and E. A. Siegler. Department Circular 376, United States Department of Agriculture, Washington, D. C.

Diseases of Brambles

"DISEASES of Brambles in Illinois and Their Control" is the title of Circular 305, just issued by the Illinois Agricultural Experiment Station. The authors are A. S. Colby and H. W. Anderson. Important developments in the control of bramble diseases have been made recently and this circular sums up the best known information available to date. The style and language of the circular are of a practical nature and

were meant for practical fruit growers. The circular is well illustrated. This will help growers to readily identify the diseases giving them trouble. Of particular value is one page which gives five pictures in color of raspberry leaves and stems infected with various diseases. The diseases whose symptoms are thus portrayed are particularly difficult to distinguish, and these colored pictures should prove of great value to practical growers.

While the circular was prepared primarily from the standpoint of Illinois conditions, the information contained in it is no doubt applicable over a wide territory. Growers who are interested in the circular may obtain a copy by writing the Agricultural Experiment Station, Urbana, Ill.

Experimental Station, Urbana, Ill.

Testing Association Offers Stock to Growers

THE NEW YORK Fruit Testing Association is an organization of fruit growers in New York and in other states and Canada which undertakes to test new varieties recommended by the New York Agricultural Experiment Station. After supplying its members, the association distributes stock at cost to other growers interested in such new fruits.

At the present time the association is offering to outside growers, stock of the Cortland, Red Spy, Grav-

enstein, Improved Astrachan and Sweet Delicious apples.

The Cortland was developed by the Geneva station and is claimed to give promise as a means of prolonging the season for the McIntosh type of apple. The Red Spy and Red Gravenstein are typical varieties of the parent stocks, except for the solid red color. The Improved Astrachan is a cross between Montgomery and Red Astrachan, which is later and has a much greater tendency toward annual bearing than the Red Astrachan. The Sweet Delicious is an early mid-season apple which is said to be especially good for home use. It is the result of a cross between Beacon Jones and Delicious.



Tapping a Rubber Tree on a U. S. Rubber Company Plantation

The United States Rubber Company now owns over 7,000,000 rubber trees—more than 5,000,000 of them are already producing rubber for U. S. Tires, and 20,000 employees are engaged in caring for them.



Here are the Answers to Your Questions on the American Rubber Supply and Automobile Tires

Q—Where does America get its rubber?

A—The only important source of rubber for all the world is the rubber plantations in the Far Eastern possessions of Great Britain and Holland.

Q—Is America represented among the Far Eastern rubber planters?

A—Yes, the largest of all these Far Eastern plantations is owned and operated by the UNITED STATES RUBBER COMPANY.

Q—Do the United States Rubber Company Plantations produce any considerable quantity of rubber?

A—Yes, they produced 20,000,000 lbs. of rubber in 1925, and in the next few years the output will be increased about 75%.

Q—Then the growing of rubber by Americans for Americans is not a new thing?

A—No. In 1909, this Company acquired their vast tracts of ideal rubber growing land in Sumatra and Malaya.

Q—How large are the U. S. Rubber Plantations today?

A—The U. S. Rubber Company Plantations now comprise about 136,000 acres, with over 7,000,000 rubber trees, sixty miles of narrow-gauge railway, and 200 miles of motor roads. They give employment to 20,000 people.

Q—What does all this mean to me as a buyer and user of United States Tires?

A—The United States Rubber Plantations and their results have brought many benefits to every user of U. S. Rubber products of all kinds. For instance:

1. **Latex-treated Web Cord**, one of the outstanding major improvements in tire-building, announced by this Company in 1922.

2. **Sprayed Rubber**, the new standard of purity in crude rubber, of direct benefit to every user of any U. S. Rubber product.

3. **In Addition**, during the past 17 years, the U. S. Rubber Plantation Experts have conducted thousands of successful researches into improving rubber by improving the rubber trees.

Q—What is Latex-treated Web Cord?


A—This is the new cord structure for cord tires, combining maximum strength with maximum flexibility. *Questions and Answers on Latex-treated Web Cord* will be published shortly.

Q—What is Sprayed Rubber?

A—Sprayed Rubber is the new pure rubber. It is free from both acid and smoke. *Questions and Answers on Sprayed Rubber* will also be published at an early date.

Q—Will America ever be reasonably independent in its rubber supply?

A—Probably so, in the course of time. For instance, the U. S. Rubber Plantations will probably yield 15 per cent more rubber in 1926 than in the past year.

United States  Rubber Company

Trade Mark

UNITED STATES
ROYAL CORD
BALLOON

Spraying Trees in Bloom Injurious to Honeybees

WHEN spraying fruit trees, care should be taken to do the work at a time when there is the least danger of poisoning the honeybees which visit the blossoms and which are very necessary for the pollination of the flowers, says the United States Department of Agriculture. Spraying fruit trees while in full bloom with arsenicals is particularly injurious to bees, according to tests which have been completed recently by the Bureau of Entomology.

Of course the beekeeper does not want his bees poisoned, says the department, because as a result his honey crop is reduced. The subject should be of even more interest, however, to fruit growers because with the loss of the honeybees they lose the most effective means of pollination in their orchards. In this respect the beekeeper, the fruit grower, and in fact all concerned are benefited by honeybees.

The effect of arsenical sprays on the mortality of honeybees has long been debated, but only a few systematic investigations have been made to aid in settling the dispute. In the hope of answering definitely some of the questions so long debated, these tests were conducted. While they are limited in their scope, they do enable the

department to make some recommendations.

Spraying apple trees during full bloom is not recommended because the codling moth can be as well controlled by spraying when 90 per cent of the petals have fallen, and because spraying when the trees are in full bloom is injurious to insect pollinators.

Winter vs. Summer Pruning

LITTLE difference has been noted between winter pruned and summer pruned apple trees on the grounds of the New York State Agricultural Experiment Station at Geneva, where a comparison of winter and summer pruning has been in progress for several years. The station horticulturists advocate pruning apple trees in winter, however, when the operation can be more carefully and easily performed.

At this season of the year there is no foliage to prevent the orchardist from seeing at a glance just which branches should be removed. Moreover, as soon as the trees commence to bear, it is always difficult to take out wood which should be eliminated because of the crop of fruit.

Baldwin, Boiken, Esopus, Hubbardston, McIntosh, Spy and Greening have been pruned both in the summer and in the winter on the station

grounds. There are no differences to be noted in the size or shape of the trees, it is said, all being equally good, stocky, stout trees with large heads and typical of their respective varieties. The general shape and size of the tops of both summer and winter pruned trees is the same, and pruning at different periods in the year seems not to have affected the growth, shape or character of the trees in any respect.

Either practice of pruning will prove satisfactory while the trees are young, declare the station horticulturists, but for sake of convenience fruit growers may well adhere to the usual plan of winter pruning when the framework of the tree is entirely visible and when other farm operations are less pressing.

Nitrogen Helped Peach Trees Withstand Cold

By R. B. Fairbanks

IT PAYS in more ways than one to fertilize fruit trees, and especially peach trees. An experiment in Henderson county, which is in the western part of North Carolina, makes this point clear.

In a block of 500 peach trees all except one row were given one pound nitrate of soda per tree in 1924, just about the time the buds commenced

to swell. One row was left unfertilized but was given the same treatment in other respects. One of the fertilized rows yielded about 25 bushels of No. 1 peaches, despite the fact that the trees early in the spring had to contend with freezing temperature. Those trees that were not fertilized shed the blossoms and no fruit set at all.

Commenting further with reference to this experiment, H. R. Niswonger, Horticulturist of the North Carolina Extension Service said: "This spring, one year from the time the pound of nitrate of soda was applied, all the trees in the block bloomed and another cold snap came along. Those trees in the rows treated with nitrate of soda last year set a good crop, while the remainder in the orchard shed both bloom and fruit. The use of nitrate of soda combined with good cultivation and the sowing of cover crops, has proven a profitable investment in this orchard."

It is thus seen that not only did the nitrate of soda cause the trees to set and produce a good crop of fruit in 1924, but it actually caused the trees to more successfully withstand a cold snap the year afterwards. This is to be expected, because the fertilized trees were in a stronger and more healthy condition and thus able to withstand more cold than the unfertilized trees.

Dynamite Loosens Hard Soil for Trees

"THE USE of dynamite in digging the hole for tree planting may be helpful where the soil is dry and hard, and where the top soil is thin and rests upon shale or a subsoil that is mixed with stones and gravel; it is not necessary, however, when soil conditions are favorable to digging," says F. H. Ballou, Associate Horticulturist, Ohio Experiment Station.

"Where the top soil is fully a shovel blade in depth, is underlaid with a clay subsoil, is moist and in condition to be readily handled with a shovel, there is no advantage in using dynamite. Under these conditions trees come into fruiting as soon and do as well in every respect as those set in excavations made by blasting. As the roots spread rapidly in every direction, they soon outgrow the small space loosened for them by blasting.

"However, dynamite may prove helpful in digging holes when the soil is dry and hard and difficult to loosen and remove with pick and shovel, or even where the soil is moist but lies shallow over hard or stony subsoil.

"To dynamite for tree planting, one-fourth or third of a stick of dynamite is placed at the bottom of a hole drilled 18 or 20 inches deep where the tree is to stand. Fine soil is firmly tamped above the charge, which is then exploded, finely shattering and bulging, but not throwing out the hard dry earth. This makes easy work of shoveling out the soil.

"Dynamite should not be used in a moist clay subsoil in spring, for the blasting will leave cavernous openings around which the clay subsoil will dry hard. These will cause the soil about the tree roots to settle unevenly, throwing the tree out of position."

Cold Storage Holdings of Apples

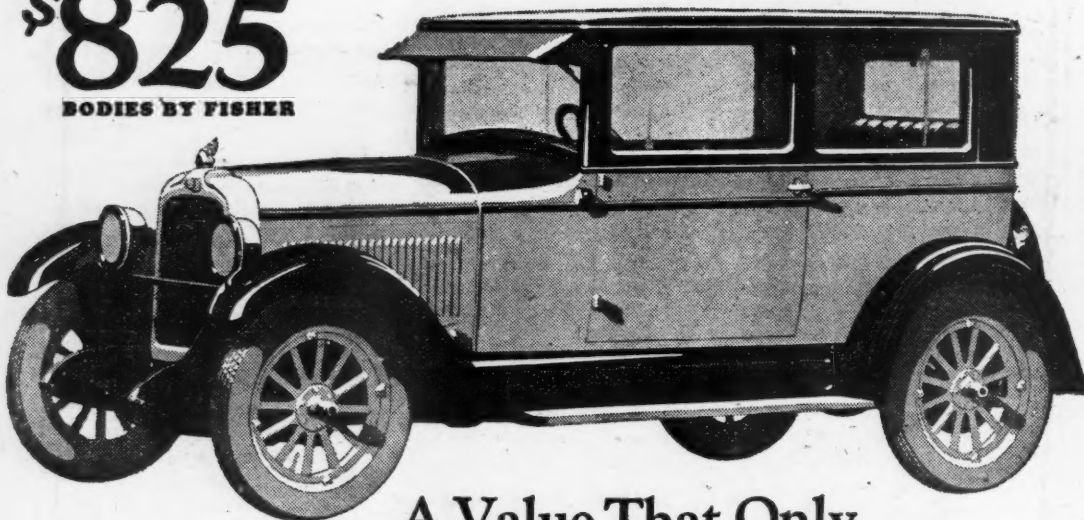
THE MONTHLY report of the Bureau of Agricultural Economics, United States Department of Agriculture, shows the following cold storage holdings on apples on February 1, 1926:

3,157,000 barrels compared with 2,498,000 barrels February 1, 1925, and a five-year average of 2,817,000 barrels. 9,859,000 boxes compared with 7,264,000 boxes February 1, 1925, and a five-year average of 8,272,000 boxes.

1,674,000 bushel baskets compared with 940,000 bushel baskets February 1, 1925.

Subscribe for the AMERICAN FRUIT GROWER MAGAZINE—three years for \$1.

COACH OR COUPE
\$825
BODIES BY FISHER



A Value That Only General Motors Could Achieve

Scoring an immediate and spectacular success, the new Pontiac Six is already one of the most discussed cars in America.

To introduce into the field of low-cost sixes, inducements to ownership other than price... to overcome the limitations of ordinary performance, comfort, appearance and quality... there has been brought to bear on the development of this new Six, all of General Motors' engineering skill, manufacturing experience, production facilities and purchasing power.

Oakland Six, companion to Pontiac Six, \$975 to \$1295. All prices at factory

OAKLAND MOTOR CAR COMPANY, PONTIAC, MICHIGAN

At its price, the new Pontiac Six, with body by Fisher, is an achievement no less important than the first six-cylinder engine. This is true, simply because it introduces elements of beauty, size, stamina, comfort and performance, entirely without precedent.

You are invited to inspect the new Pontiac Six, now being displayed by Oakland-Pontiac dealers everywhere. Go prepared for a revelation... for only General Motors could produce such a car... and price it so low!

PONTIAC SIX

CHIEF OF

THE SIXES



Use Hydrometer to Determine Strength of Lime-Sulphur Solution

THE STRENGTH of concentrated lime-sulphur solutions varies. Especially is this true of materials made at home. For this reason many growers prefer to determine the strength of their materials both in the concentrated and dilute conditions by using a hydrometer rather than by trusting solely to the quantities recommended in the various spraying schedules.

If a grower can determine by means of a hydrometer the specific gravity of the concentrated solution, he can proceed with far greater confidence in his spraying operations. The table given below, taken from Illinois Circular 277, is based upon this plan of operation. In order to use this table, a grower should first determine by means of a hydrometer the specific gravity of the concentrated solution he is using. He should then consult the two columns at the right hand side of the table to determine the quantity of the concentrated solution which should be used to make 50 gallons of diluted spray for dormant or summer spraying as the case may be.

Dilution Table for Lime-Sulphur.

Degrees Baume.	Specific gravity.	For dormant spraying.		For summer spraying.	
		Gal.	Pints.	Gal.	Pints.
20.....	1.1600	11	6	2	2
21.....	1.1693	11	—	2	2
22.....	1.1788	10	4	2	—
23.....	1.1885	10	—	1	1
24.....	1.1983	9	4	1	6
25.....	1.2083	8	6	1	5
26.....	1.2184	8	—	1	4
27.....	1.2288	7	4	1	3
28.....	1.2393	7	1	1	2
29.....	1.2500	6	6	1	2
30.....	1.2608	6	4	1	1
31.....	1.2719	6	1	1	1
32.....	1.2831	5	6	1	0
33.....	1.2946	5	4	1	0
34.....	1.3063	5	2	—	—
35.....	1.3181	5	—	—	7

Spray for Peach Leaf Curl Now

PEACH leaf curl does a great deal of damage each year. The unfortunate thing about this disease is that when it makes its presence known it is too late to treat it. This disease must be treated during the dormant season or it cannot be treated at all.

It is too late now to treat the disease effectively in southern peach sections, but in northern sections where the buds are still dormant, there is still time to treat the disease effectively.

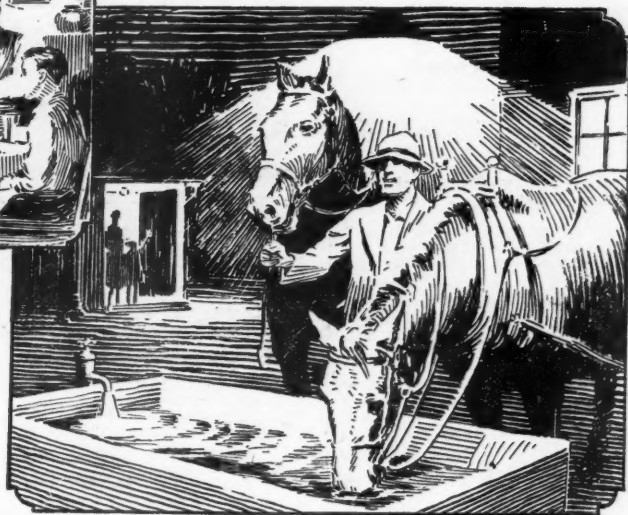
For controlling peach leaf curl, the trees must be sprayed thoroughly with lime-sulphur solution, one part to 20 parts of water, or with 4-4-50 Bordeaux mixture. The spray must be applied before the buds begin to swell. Thoroughness of application is absolutely necessary. The twigs must be entirely coated on all sides if control is to be efficient. If the wind is blowing strong from one direction, the trees should be sprayed a second time from the other side, provided this will insure more complete covering of the twigs.

Delay in application until after the buds begin to swell frequently allows the spores of peach leaf curl to germinate, and thus the disease may be beyond control when the spray is applied. The tree should be sprayed when completely dormant. If San Jose scale is present, lime-sulphur solution at a dilution of one part in nine parts of water should be used in place of the weaker solution.

Profits From Apples

CAREFUL records kept for a period of 20 years on the cost of every orchard operation and on the income from the sale of the fruit from a typical 10-acre Baldwin apple orchard in western New York show that apple growing has paid an attractive profit, at least in this orchard, says Dr. U.

COMFORT CONVENIENCE CONTENTMENT



DEPENDABLE DELCO-LIGHT FARM ELECTRICITY

DELCO-LIGHT COMPANY, Subsidiary of General Motors Corporation, Dept. E-40, DAYTON, OHIO

P. Hedrick, horticulturist at the New York State Experiment Station at Geneva, who supervised the taking of the records.

The average yearly net profit on a barrel of apples for the 20-year period was \$1.51, and the average annual profit per acre for the 20 years was \$120.71. Estimating that the orchard is worth \$500 per acre, the average annual net dividend has been 26.3 per cent.

These and many other interesting figures on the costs and profits in growing apples in western New York are presented in a bulletin by Dr. Hedrick which may be had free of charge upon request to the station by anyone interested in the study.

Dr. Hedrick has made a special

study of the cost of production in an orchard which he believes to be typical of many fruit plantings in the state, and he believes that the figures that he has secured may be duplicated by fruit growers in general.

Set Apple Grafts Early

APPLE grafts made during the winter months should be set out in the nursery row just as soon as the ground will do to work, according to T. J. Talbert of the Missouri College of Agriculture.

The rows should be laid off about three and one-half to four feet wide. The furrow may be opened with a small turning plow. The grafts are then planted in the furrow from 10 to

14 inches apart by standing them up against the vertical side. The soil is then thrown against them with a plow or hoe. The grafts should be planted deeply, allowing only one or two inches to be exposed after the soil is leveled and packed about them.

The grafts should receive frequent and thorough cultivation during spring and summer to keep down weeds and conserve moisture. The young trees may be set in the orchard after one season's growth or they may be allowed to grow two seasons before transplanting.

"How about some nice horse-radish?" said the grocer to the bride. "Oh, no, indeed! We keep a car."



Better Pest Control

Apply California methods to your pest control problems. On the Pacific Coast there has been developed a radically new and different type of oil spray—one that combines extraordinary effectiveness with a new degree of safety from burning and injury, a spray so safe that it can be used summer or winter.

This material—Volck—has revolutionized pest control methods in the citrus groves of Southern California. Even the so-called resistant scales, heretofore immune to control efforts, have been conquered by its use. These results are possible because we have segregated the elements that kill the pest from the elements that injure vegetation, making possible the use of killing dosages without the old hazard to fruit and foliage.

Kill San Jose Scale

Volck has not only produced amazing results against citrus pests, but against San Jose scale and other pests on deciduous trees as well. It has been used for two summers in the famous Wenatchee and Yakima Valleys, Washington, and other sections in the Pacific Northwest noted for their fine apples. In these sections Volck has ended the San Jose scale problem, has proven highly effective against codlin moth (killing it in the egg), and has been the means of salvaging many thousands of dollars worth of apples that would otherwise have been unmarketable.

Strawberry growers have found in Volck a safe and certain means of controlling Red Spider. Nurserymen and others use it for the control of scale and other insect pests on the most tender plants, as it kills the pest without injury to flower or foliage.

A Safe Summer Spray

Because of its wide margin of safety Volck is a real summer spray and can be applied any time of year.

Write for booklet and full information on this new and better oil spray.

California Spray-Chemical Co.
204 Franklin Street, New York City



Also: Watsonville, California; Yakima, Washington; Orlando, Florida; and many other centers.

VOLCK

They Say—

"It's Always Ready"

"A neighbor fell behind with his work on account of the late, wet season. He asked us to help him by plowing forty acres of corn with our Case tractor. We began at 7:30 A. M. Thursday, ran through the night, finished Friday at 6 P. M. plowing 7" to 8" deep."

One more crop in on time because of Case capacity and dependability. Case power is always on tap in an emergency.

J. I. Case Threshing Machine Co.
Incorporated — Established 1842
Dept. R1 Racine Wisconsin

CASE

Co-operative Spray Program for the Cumberland-Shenandoah Valley

By Pathologists and Entomologists of Virginia, West Virginia, Pennsylvania and Maryland

THE CUMBERLAND-Shenandoah Valley is a great apple producing region which extends into parts of four states. Many growers in this region operate orchards in two or more states. The growers' problems throughout this great valley are very similar, yet four state experiment stations have been giving advice to these growers which has often proved confusing. It should be possible to develop a uniform schedule for this section.

The idea of co-operation and the possibility of getting together and agreeing on uniform recommendations for this great apple section originated at a conference of directors of experiment stations held not long ago in Saint Louis. The direct outcome of the idea was a conference called by Director Knight of the West Virginia station and held at Winchester, Va., July 20, 1925. Experiment station workers from the states of Virginia, West Virginia, Maryland and Pennsylvania attended this conference and appointed several committees to work on the various prob-

lems of the fruit industry in this region.

The following "Uniform Spray Program" is the direct result of the work of one of these committees composed of entomologists and plant pathologists representing the four states. The previously existing recommendations in the four states have been carefully compared and all variations and differences adjusted so far as possible, making allowances for climatic and other conditions. Materials, times of application (uniformly defined), dilutions and dosages of lead and nicotine are uniform. The program has the approval of pathologists and entomologists of all four states for the season of 1926. It is confidently believed that the apple growers of this region will be better served by co-operation and correlations of this sort, and that the program as here presented is something unique of its kind. Provision has been made for future conferences of representatives of the four states involved, and the 1926 program will be revised and kept up to date.

APPLE SPRAY PROGRAM FOR THE CUMBERLAND-SHENANDOAH VALLEY REGION FOR THE SEASON OF 1926.

Name.	Purpose.	Time.	Material for 100 gal. of spray.
Delayed dormant.	Scales. Aphids. Red Spider.	When green can first be seen in the tips of the blossom buds. The exact time of this spray in Pennsylvania is to be determined by the spray service and usually occurs when the green ends of the more advanced blossom buds are out $\frac{1}{4}$ to $\frac{1}{2}$ inch.	Lime-sulphur, 32 degrees Baume, 12 gal.; nicotine, $\frac{1}{2}$ pt. In Pennsylvania a dilute lime-sulphur solution of sp. gr. 1.03 is used. Oils may be used for scales. Pennsylvania includes 3 lb. lead arsenate for bud moth and leaf roller.
Pre-pink — Not generally recommended for the region except in Pennsylvania.	Scab. Frog-eye.	When first tint of red shows in central flower bud, or as determined by spray service.	Lime-sulphur to test 1.003.
Pink — Virginia and West Virginia omit this spray on Yorks and Grimes when scab is the only pest present.	Scab. Mildew. Frog-eye. Curculio. Bud moth.	When the majority of the cluster buds have separated, or as determined by spray service.	Lime-sulphur, 32 degrees Baume, 10 qt.; lead arsenate, 3 lb. In Pennsylvania a dilute lime-sulphur solution of sp. gr. 1.008 is used. Virginia does not include arsenate except when curculio is present.
Petal fall.	Scab. Mildew. Frog-eye. Codling moth. Curculio. Leaf roller and other chewing insects. (Red bug.)	When most of the petals have fallen.	Lime-sulphur, 32 degrees Baume, 10 qt.; lead arsenate, 3 lb. In Pennsylvania a dilute lime-sulphur solution of sp. gr. 1.008 is used. Nicotine, 1 pt., only when red bug is known to be present.
Ten days' spray.	Scab. Frog-eye. Mildew. Curculio. Codling moth.	Ten days after the petal fall stage, or as determined by spray service.	Lime-sulphur, 32 degrees Baume, 10 qt.; lead arsenate, 3 lb. In Pennsylvania a dilute lime-sulphur solution of sp. gr. 1.008 is used. Arsenate not recommended in Virginia except for leaf roller. Nicotine, 1 pt., is considered necessary in Pennsylvania for red bug.
Five weeks' spray.	Codling moth and other chewing insects. Blotch. Bitter rot.	About 5 weeks after petal fall stage as determined by spray service.	Lead arsenate, 3 lb. in either lime-sulphur or Bordeaux, as advised by spray service.
Mid-summer spray.	Codling moth and other chewing insects. Blotch. Bitter rot.	About 10 weeks after petal fall stage, as determined by spray service.	Lead arsenate, 3 lb. in either lime-sulphur or Bordeaux, as advised by spray service.

So This Is Marriage

Mary Anne gave notice she was going to be married. Her mistress, perturbed, said, "Of course, I don't want to put any obstacle in the way of your getting married, but I wish it were possible for you to postpone it until I can get another maid."

"Well, mum," Mary Anne replied, "I hardly think I know 'im well enough to ask him to put it off!"

He Seconded the Motion

A man was recently blackmailed with a very threatening letter reading: "Place \$5000 under the stone at the entrance to your gate by nine o'clock tonight or we will kidnap your wife."

Nine o'clock that night the kidnappers found a notice as follows: "I haven't a cent but I am in favor of the movement."—Strathmorean.

Fortify for Fire Fighting

IMPROVED
Pyrene
EXTINGUISHER



Farm fires are double misfortunes. Great values are at stake.

City fires destroy a man's business or his home. Farm fires destroy both home and business in one sweeping blaze when equipment goes.

Farmers equipped with the Improved PYRENE are safe. A few strokes of the double-acting pump and the fire is out.

With PYRENE their wives and children can beat back flames, too—if the men are away. PYRENE works so easily and simply—it never sticks, jams or corrodes. Improved PYRENE makes fire a failure and every farmer's investment safe.

Pyrene Manufacturing Co.
Newark, N. J.

Pyrene
KILLS FIRE
SAVES LIFE

Caution: Use only Pyrene Liquid (patented) with Improved Pyrene Extinguishers.

BABY CHICKS From 20¢

Chicks from winter laying, farm raised, mature stock. White Wyandottes, White Rocks, Black Minorcas, S. C. W. Leghorns, B. I. Reds, Barred Rocks, White Orpingtons, Anconas, Black Jersey Giants, Indian Runner Ducks, \$15 per 100 up. Pekin Ducks, live delivery guaranteed. Pared post prepaid. Hatching eggs, \$8 and up per 100. Circular free.

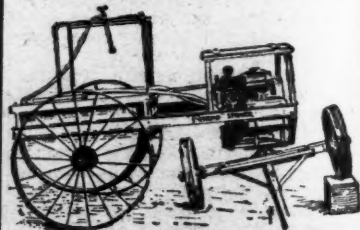
Belgian Hares, New Zealand Reds, Flemish Giant Rabbits.
GLEN ROCK NURSERY & STOCK FARM.
Hidgewood, N. J.

BETTER SPRAYING MEANS BIGGER PROFITS

Every year fruit growers admit at harvest time that they realize they omitted one or two important sprays or failed to make thorough applications, and in almost every case this inconsistency in the spray program is given as the abill for the high percentage of defective fruit.

YOU KNOW THE REASON FOR FRUIT LOSSES — WHY NOT REMEDY THEM!

Following the right spray schedule for your section, using proper materials and making thorough applications will produce perfect fruit.



"FRIEND" CUT UNDER TYPE SPRAYER

For making the spray applications you will find "Friend" sprayers are best in the long run. They are low down, short turning, easy draft, pump steady high pressure, light weight, plungers and valves easily accessible, very simple and sturdily built throughout.

We make hand, power, combination and traction sprayers for every purpose.

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110 East Ave., Gasport, N. Y.

Magazine Reaches High Level, in Dorsey's Opinion

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: I have been following the AMERICAN FRUIT GROWER MAGAZINE pretty carefully since I came to Illinois. Since last fall I have had an opportunity to be among the growers in different parts of the state in connection with the horticultural schools or society meetings. I have been surprised at the number of times questions have come up regarding things different growers have read in the AMERICAN FRUIT GROWER MAGAZINE. One night last week I spent the evening with the last two issues of the magazine, and it was plain to me, after looking at it from both angles, just why so much interest was manifested in the different suggestions obtained from reading the different articles.

This, of course, is not a new story to you; but it was in some ways a new angle to me. I am just beginning to appreciate what my friend Kirkwood used to tell me about the effectiveness of the press in "putting things across." I have wondered if the owners of the AMERICAN FRUIT GROWER MAGAZINE really appreciate how much of a horticultural institution the magazine is becoming. If they are inclined to question this, get them out where they can talk with growers and then they will learn what a part the AMERICAN FRUIT GROWER MAGAZINE plays in building up a national point of view among horticulturists. It seems to me that the way things are stacking up now in the horticultural world, that the guiding motive back of a magazine of this kind should be the service to the industry in the broadest sense rather than just making money. You, of course, know how definitely the two must ultimately be linked together.

The high level that you have reached with the magazine leads me to believe that this last point is appreciated. You are, of course, in touch with the background of good will and high regard toward the magazine among the men who grow fruit, so that this note from me may appear like needless repetition. Nevertheless, I thought it might be reassuring to you to get a personal note from me to that same effect. It seems to me you are doing a good job at not only tapping the sources of latest information, but also in keeping an even keel with many conflicting tendencies.—M. J. Dorsey, Chief of Pomology, University of Illinois.

ANSWER: I appreciate very much your fine letter of recent date. I appreciate it all the more because the expression was made spontaneously on your part. You have outlined better than I could the things I have been trying to do in connection with the magazine. It has been my thought from the start that the magazine should contain the latest and most authoritative information obtainable on important phases of fruit growing to the end that growers may make the earliest and best use of the information collected by the experiment stations and the United States Department of Agriculture. At the same time I have felt that such information must be presented to growers in a practicable and readable fashion.

I am very glad to know that you feel this object is being attained. I need not assure you that I regard your opinion highly, and while we frequently receive expressions of this nature, your letter, coming from a man who is in intimate contact with field conditions, is regarded as particularly significant.

I want to add that the splendid co-operation which the station and government men have given me has been a real factor in conducting the editorial work.

Committee to Control Low Grade Apples

ADOPTION of a resolution calling for the appointment of a committee of three to have full control over the disposition of low grade apples was the outstanding accomplishment of a two-day spring convention of Chelan County Farmers' Union at Yakima recently. More than 100 members of the union and other growers attended. The resolution was offered by J. R. Peters at the conclusion of an address on "Marketing Low Grades." He cited many cases where, he charged, fourth grade apples had done Washington fruit much harm on southern markets.

The resolution follows: "that culls, fourth grade and a certain per cent of small, uncolored 'C' grade apples are doing incalculable damage to the fruit industry of the Northwest, being shipped without any sort of control or

consideration of the injury done to our higher grades."

After a discussion, Chairman Pool announced that he would first confer with growers before naming the committee.

Wiping Machines to Remove Arsenic

TO REMOVE arsenic spray residue on apples, the Okanogan Growers' Union at Okanogan, Wash., will install five fruit wiping machines to cost \$2500, in its central packing shed.

Box labels will show that the fruit has been wiped and the organization will capitalize the feature. It is thought that in some cases it will be possible to command a premium price.

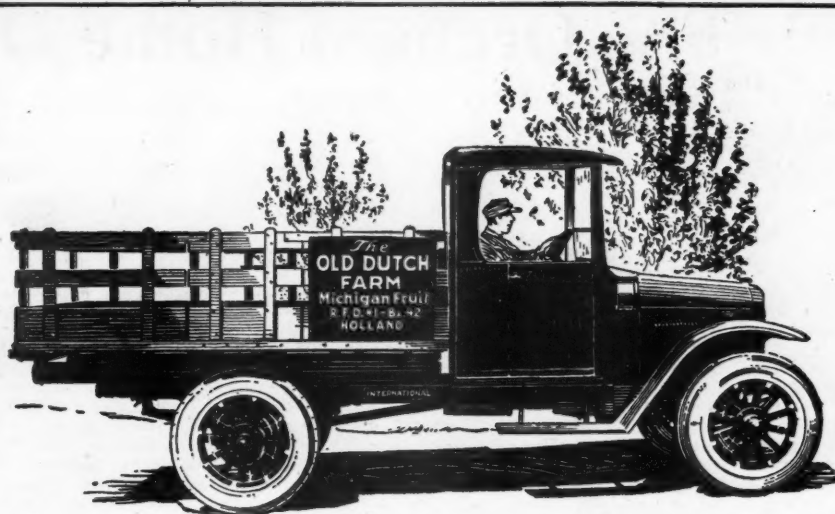
The wiping machines will be installed just ahead of the fruit grading machines. In the wiping process, the fruit will pass over horizontal revolving rollers and be slapped by 500 pieces of canvas. The machines are electrically driven and are provided with a fan to remove dust and debris.

Robins Damage Strawberries in Florida

ALTHOUGH the robin is a welcome visitor to many persons, strawberry growers in Florida are not in a poetic or sentimental frame of mind so far as this bird is concerned. Unfortunately, the robins like strawberries extremely well, and they do not hesitate to strip the plants of their luscious fruits. They cause serious financial loss to the strawberry growers, and, as would be expected, the growers are unremitting in their efforts to keep the birds scared off of their berry fields.

The Florida Experiment Station reports that robins are threatening serious damage to certain experimental plots which are located near Plant City. It is no small task to keep the birds off the plots so that reliable data may be secured.

Our modesty always suggests that those who admire us most, are the ones who understand us best.



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This is the age of swift traffic. He who crawls is lost in dust and poverty. The key to orchard and farm profit is lowered cost of production—maximum work with minimum labor cost—waste time turned into producing time. An hour lost is silver lost. More than ever, time is money.

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"A raveled rainbow overhead
Lays down to life its varying thread,
Love's blue, Joy's gold, and fair between
Hope's shining light of emerald green
With either side, in deep relief,
A crimson pain, a violet grief."

AS I SIT down this evening, I am a humbler yet happier person than when I rose this morning. The early sunshine and the tinkle of my phone roused me to a familiar voice saying that my friend was going to make a call on two old maid cousins many miles away. Would I come along?

As we spun over the shining road, I was told more of the two old ladies. After the death of all their near relatives, they had lived together for upwards of 30 years. The elder sister was now 74, the younger almost as old, but afflicted from childhood and not advanced mentally beyond that period. Having lost considerable property one way and another, they had a bare livelihood eked out by the efforts of the elder, who still gave music lessons to some dozen little girls of the village.

My heart rather sank at this news, for I thought—How pitiful for the invalid sister! What a wretched existence for the elder, caring through a long life for one who could not even be a companion. How gloomy and depressing this visit was going to be!

And now it is over, and I have seen that the one best possession in all the world is a happy heart. The house was big, too big indeed for the little old ladies. Much too big for the one who did all the work from building fires to carrying water from the well. And the walls, the chimneys, the steps were almost dangerously ruinous.

Yet our welcome was of the sweetest and brightest. Swiftly the aged feet trotted about making us comfortable. And noticeably lacking was that tone of self-pity, which might well have been expected.

The dear old soul chirped as gaily as a bird. No, indeed! She was no great housekeeper, but she managed to keep Lucy and herself fat and well. She managed to raise a few vegetables and many pretty roses. And there was the village hospital close at hand. She managed to visit it every day and have a chat with those who needed company. Apparently she "managed" whatever was required of her by necessity or kindness.

Such nice neighbors as they had, too. Near, but not too near. And here were told some spicy anecdotes, with a twinkle of wit and a peal of unmalicious laughter.

We admired the rare old china tea set from which we were being served, and our hostess exclaimed, "What do you think? Someone tried to buy this china off of my very table. But I said, 'I can't give it up.' 'Oh, yes, you can,' said she. 'You don't need the china and you would have the money.' But I told her, 'I have everything I want now, and if you bought my china I wouldn't have it.'" She broke into a laugh and said mischievously, "I think it's grand to be old. One can say exactly what one pleases."

So there it was—she had "everything" she wanted though she had so little of this world's goods. She thought it "grand" to be old. The very things over which you and I would be crying our eyes out she accepted as blessings. And her spirit converted them into real blessings. Because of her age and poverty, all gave her that tender pity which is akin to love, and besides, everyone loved her for her precious self.

So I'm home again, the richer by several jars of home-made jellies. The humbler for thinking to myself, "What would I do under like circumstances?" Burdened with the care of a childish invalid. Working harder at 74 than a young woman. Uncomfortably housed. Poorly dressed. Something near nothing a year to live on. Could I "stick to it?" Would I "carry

on" as did this brave, joyous soul? And in the answer my heart gives, there's nothing to make me proud.

Perilous Products

CHEMISTRY has long been the farmer's friend. It prescribes the ingredients for his sprays and enables him to add just the right compound to his acres to make them most productive. But chemistry sometimes adopts a role far less pleasing to the farmer. It enters his field of effort and undertakes to give the people food and drink and even clothing. "Just as good and cheaper" than he can.

Synthetic drinks dealt quite a blow to the fruit juice industry. Lately we have learned that a substance practically identical with white of egg, can be chemically produced at low cost.

About five years ago, chemistry invaded the clothing field. We've read of paper dresses and glass dresses, but they remained curiosities and affected not at all the raisers of wool and flax, silk and cotton. Then artificial silk entered the market in good earnest.

But even Japan, the largest producer of raw silk, remained unmoved. She rested securely in the thought that nothing could supplant the silk worm. This assurance was ill-founded. Japan herself now uses quantities of artificial silk. In 1920, 8,000,000 pounds of it were turned out by the American rayon mills. In 1925, the output from January to June alone was 24,000,000 pounds, and was expected within the year to exceed 50,000,000.

More disquieting to our livestock men is the information that artificial wool has arrived. Cellulose, or wood fiber, is the base of artificial silk and also the source of artificial wool, this fabric being largely a by-product of rayon.

The short, broken threads of the "silk" are used for the yarn of the "wool" fabric. The ultimate success of the product will depend upon its appeal to the public. The material of which the artificial wool is made is said to feel as soft and warm as lamb's wool. People will not resist the cheaper price of something as good as sheep-grown wool.

But housewives want at least to know what they are buying. There should be increased demand for "truth-in-fabrics" legislation. You should write to your senators and congressmen urging them to support the "truth-in-fabrics" bill, which requires that the label shall plainly state the materials that enter into the fabric. Some manufacturers are bitterly opposing this bill. Unless farm people take up the matter vigorously with their congressional representatives, this needed legislation will not be enacted at Washington to protect your interests.

It's hateful to those of us who pride ourselves on providing our family with a healthful "balanced ration," to stomp our toe on such an upsetting report as this: Thomas Edison, nearly 79, is said to consume at every meal, without variation, "a piece of toast, one and one-half glasses of milk, a tablespoon of cooked oats and one sardine." On this outrageous diet he weighs 186 pounds, and works 18 hours a day!

"Did you give the man the third degree?" asked the police officer.

"Yes, we browbeat and badgered him with every question we could think of."

"What did he do?"

"He dozed off and merely said now and then, 'Yes, my dear, you are perfectly right.'—Selected.

By Mary Lee Adams

The One-Woman Garden

EXTREMES were touched in two recently published notes on gardens. The first told of a well-known New York financier who was about to destroy \$1,000,000 worth of property adjoining his residence in order to enlarge his flower garden. The space, on which stood a magnificent mansion that was to be razed to the ground, measured 100 by 150 feet, making a garden plot of unrivaled costliness.

The second notice dealt with the one-man garden. That appealed to me more nearly. It spoke of the increasing interest in small gardens as "one of the most inspiring features of American life." The New York botanical garden endeavors to further this interest by offering cash prizes for the three best small garden plans submitted by any person from any state. It is thus a nation-wide competition.

Expense is one of the factors considered in awarding the prizes. It is reasonable to presume that people who wish to plant so small a garden have not a fat purse. That seems to bring it close to the general economic status of the orchard woman.

Can You Do It Alone?

That might well be the first question you ask of your garden plan. If you are the average orchardist's wife, dependent almost entirely upon your own efforts for the cultivation of your flowers, by all means plan a one-woman garden.

Even if John Henry makes pleasing and sincere offers of assistance in preparing the soil and helping you with the planting, you should not (while, of course, graciously accepting his aid) overlook the fact that there is a busy summer ahead of him. When the first flush of enthusiasm has passed, as it is wont to pass in hotter days, he will certainly not lack excuse for leaving the flowers entirely in your care.

Throughout the summer, if you have been wise in the matter of limitation, you may find that "as your days so shall your strength be." Otherwise, a neglected, ragged area will take the place of the trim little sweetheart of a garden from which you were led away by ambition and misplaced confidence in John Henry.

Spring is on the Way

Regularly as spring comes round, I find myself writing about gardens. Spring affects me that way. It is entirely independent of any special aptitude for gardening, being prompted solely by love for blossoming things. It comes as spontaneously as the bluebird's twitter.

Though many, many songsters surpass the bluebird in musical ability, yet we love the soft notes that are associated with the budding of spring. So with me, a garden article is a sign of dawning spring and therefore, I trust, not wholly unwelcome.

If you are going to make a new and better garden plan this year than ever before, it is none too early to start. Nursery catalogs are on the way, and you'll be tempted, almost beyond resistance, to order a great assortment of marvelous looking plants.

You couldn't begin to take care of them all. Your wishbone is stronger than your backbone. But if your small garden plan is ready, it will act as a wholesome check upon too lavish investment.

Variety in Plans

Even small plans may vary indefinitely according to the site of the garden. The one upon a slope requires different treatment from the garden that lies flat. Natural features, such as rocks or the fortunate occurrence of water, suggest a picturesque handling that should be delightful.

Trees and shrubs may be the deciding factor in your choice of a garden spot.

Trees are essential to the complete beauty of a country home, but we know that flowers will not bloom abundantly in their shade unless only such varieties are selected as do not require sunshine. If you have not plenty of trees, hesitate a long time before deciding to cut down a single one for the benefit of the flower garden. Try a different location for the flowers rather than destroy that lovely slow-growing ornament—a shade tree.

When we plan in the spring, we are reveling in the glad return of a warm sun. Later on we may bless the sight of a green tree, and a shady spot where we can sit or lie in a hammock may mean more to us than mere blooms, however dear and lovely.

The Front Garden

A usual site for the orchard home is on level or gently sloping ground with trees to the rear and sides of the dwelling. This arrangement is considered good by landscapists, as it frames and forms a background for the house.

In such case, the obvious suggestion to put the garden in front of the home cannot be disregarded. Some authorities advise against inclosing it. A very large garden, or what may more properly be called grounds, does not require apparent boundaries.

I think that a small garden in front of the rural dwelling never looks sweeter than when set like a little jewel in the frame of a white picket fence, a green hedge or low stone wall. This has, besides, practical advantages in the country where, too often, chickens, dogs or stock infringe upon the flower beds.

A Pretty Path

Through the little gate and up the path to the welcoming porch or door provides an agreeable entrance and makes a favorable impression upon visitors. Please don't let the walk be of concrete or cement, which are among the hardest and most unfeeling of surfaces. Spaced stepping stones, sunk in the turf, are far more sympathetic. Patterned brick gives a delightful note of color and lends a special charm. By all means let the path be straight. It has been well said that, whereas winding walks are inviting in large grounds, in the narrow limits of the one-woman garden, anything suggestive of a stroll is ridiculous.

Lawn, Trees and Shrubs

Your first consideration in planning a flower garden should, oddly enough, not be given to flowers but rather to the lawn. A few clumps of bloom against the green of well-kept grass, will appear to greater advantage than a mass of blossoms in which the charm of individual plants is lost.

If the number of shrubs must be strictly limited, they should first be placed about the foundations of the house, which need softening forms to mask their severity and to give the very desirable impression of the house being (in the phrase of landscape architects) "tied to the ground." Ivy, beds of fern or flowers may carry out this effect, but only the ivy is of any value in winter. Shrubs, even when leafless, break the harsh lines, but evergreens are here the ideal choice.

With sheltering trees, a lawn and ornamental shrubs, fine effects can be obtained even without flowers. But nothing can quite take their place. Birds, butterflies and flowers are the most fairy-like creations we know. Where they are found, we feel a sort of enchantment that is lacking without the music of song and the charm of motion, color and fragrance.

In Great Britain men must be much thirstier than infants. For every \$5 spent on milk, \$13 are spent on beer.

Ringling of Filler Apple Trees

(Continued from page 5)

Time of Ringing

There is probably no narrow limit of time in which this work must be done, but in general it should be after active growth has started in order to hasten the healing of the wound, and before fruit bud differentiation has begun. Under the conditions of this work, it has usually been the latter part of May or the first half of June. Several years ago the writer ringed one mature Baldwin tree on April 28, in New Hampshire, where the stage of plant development is a little more than two weeks later than at Wooster, Ohio. The results of the ringing were highly successful, but it was necessary to bridge graft the wound. Ringing later than the middle of June has not been practiced by the writer and there would seem to be no reason for considering it.

Effect Upon Blossoming and Yield

The effects of any practice upon fruit bud formation and upon yield are two more or less distinct things; that is, the first does not necessarily guarantee the second, although it is to be expected.

Now the effect of ringing upon fruit bud formation is usually direct and striking, but not always. It is not uncommon to find nearly every bud, the terminal and lateral ones on the new growth, as well as the terminal and sometimes part of the lateral ones on the spurs, to be fruit buds. Again, only a moderate bloom is produced. If the trees are in a good state of vigor and weather conditions do not prevent, a set of fruit will usually ensue.

Varieties have varied in this work; some make a very feeble response, others moderate, and still others respond freely. The Grimes, Jonathan, Rome, Stayman, McIntosh and Gano have blossomed heavily as a result of ringing; Baldwin, Livland and Sutton moderately, and Spy very little and sometimes not at all.

A weak tree, a very young tree or a small branch will give feeble responses, as a rule, than larger or older ones. This observation is important to note, or otherwise a wrong interpretation may be drawn from a ringing experience. The results in this regard are not consistent but in the main are as noted.

The yield of the ringed trees will

depend upon several factors. Frost, lack of vitality or improper pollination will cause the blossoms to drop just as readily, perhaps in some cases more so, as from another tree. In the main, however, a crop usually sets. The fruits develop normally, ripen about the same time and have good color and quality (and no better) as fruits on another tree. In a large orchard, the increase in yield as a result of the practice would be large. If a limb or two is treated on a 10 or 12-year-old tree and the response is a bushel or a bushel and a half per tree, the results would seem warranted, as has been the case with many of the trees in this work.

Effect Upon the Tree

When unproductive trees are healthy and vigorous, and the work is properly and successfully done, ringing appears to have the same effect as upon a tree that is blossoming heavily. Many of the terminal shoots are repressed because of terminal flowering, but otherwise there is no large difference in growth or color of foliage, although the foliage is somewhat sparser, at least in some cases. In other words, the net results are in favor of the practice of using late producing filler trees. Where wounds do not properly heal or the trees are growing under unfavorable conditions, the foliage looks yellow, the growth is stunted and injury may result.

Application to the Orchard

Ringing or girdling seems to be a useful and legitimate practice under certain restricted and unusual circumstances. If "filler" trees are late in reaching maturity, then some stimulus other than that usually secured from ordinary cultural practices seems necessary in order to promote production before they must be removed. There may be a better stimulant than ringing, such as root pruning or summer pruning, but the writer doubts it.

Indiscriminate ringing of permanent trees, or of trees too young to bear, is to be condemned. Make no mistake when the filler trees are planted; select only early bearing varieties and give them good care. Do not attempt to substitute ringing for good cultural methods, for good culture will bring about the desired results in time.

Better Farm Homes Conference

ON FEBRUARY 18 and 19 the American Society of Agricultural Engineers held a better farm homes conference in Chicago. The meeting was attended by agricultural engineers, household science experts and agricultural editors from many parts of the country. The addresses and discussions related to farm home problems.

The convention was addressed by such authorities as F. A. Wirt, President of the American Society of Agricultural Engineers, by William Draper Brinkloe of Maryland, by K. J. T. Ekblaw, farm mechanics expert, by Mrs. H. M. Dunlap, noted household science lecturer of Savoy, Ill., and wife of Senator H. M. Dunlap, by Dr. Louise Stanley, Chief of the Bureau of Home Economics of the United States Department of Agriculture, by M. C. Betts of the United States Department of Agriculture, by T. M. Sloan of the United States Department of Commerce, by John F. Cunningham, Editor of the Wisconsin Agriculturist, and others.

The address of Mr. Brinkloe showed that in house planning contests conducted for farm papers nearly half the plans submitted were for one-story bungalows. Preferences were shown for houses of six rooms, next for five rooms and next for seven rooms. Bathrooms were specified in 98 per cent of the plans, most of them placing the bath on the first floor. Fifty per cent of the plans called for frame houses, the remain-

der for brick, stucco and concrete block. Forty per cent of the plans called for hardwood floors. In addition to hot air furnaces and steam heating plants, 50 per cent specified fire places. The preference was marked for the main stairway in the rear of the house instead of in the front.

Mr. Ekblaw emphasized the employment of a good architect for developing a house plan. Planning should start a long time ahead of actual operations. Most plans are changed during construction, and the cost usually runs from 10 to 20 per cent higher because of the changes made. A small house well built is better than a big one poorly built. Timbers exposed to dampness should be treated with a wood preserver. Painting is of great importance and should be seriously regarded.

Mr. Ekblaw particularly emphasized the advisability of fireproof construction in the country. Fireproof dwellings cost but little more than frame dwellings and are much less subject to loss by fire, as well as more permanent. Bricks possess wide possibilities in permanence and beauty. The mortar joint is of great importance in giving a good appearance to a brick house. Hollow tile makes a good wall and offers a superior base for stucco. Concrete has received a lot of study and can be used in all portions of a farm dwelling. It is fireproof, strong, durable and sanitary.

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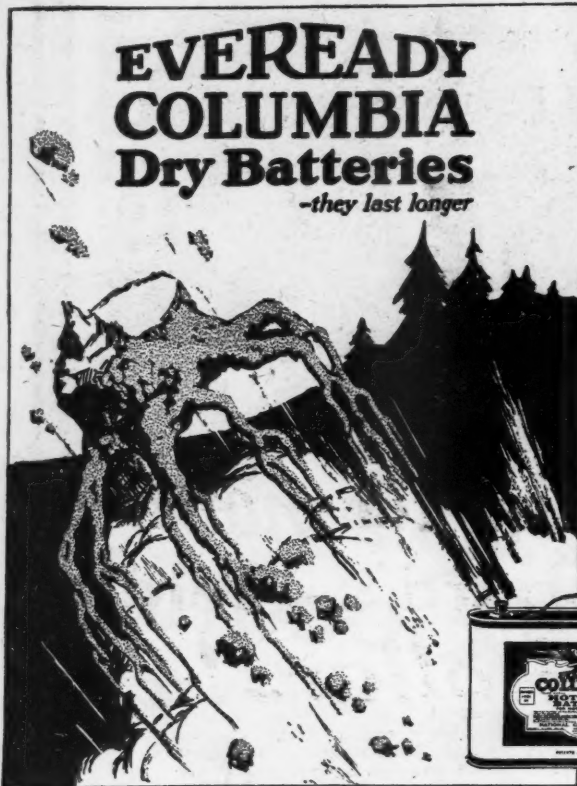
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CHATS WITH FRUIT GROWER'S WIFE

By HAZEL BURSELL



Planning the Home Garden

"OH, WHAT a lovely garden! The house is plain and old, but the garden makes it seem beautiful. They just have a few shrubs and climbing vines in front, together with neat, well-arranged beds of gayly colored flowers. And see, they have their roses all in one place in an enchanting rose garden at one side! And there around the corner of the house you get just a glimpse of the rock garden and lily pool at the back. What wouldn't I give to own a garden like that! But I'll never have it—I have neither the time nor the money."

Thus run the thoughts of the average homemaker as the family motor car takes her past someone's beautiful garden. We think we'd give almost anything to possess such a garden, or even walk therein for a little while. Then we pass on and resign ourselves to living without one of the loveliest and most inspiring things life has to offer.

Time Is Required

But we could each have our dream garden, if we wanted it intensely and were willing to plan and work hard to achieve the desired results. Not even the poorest and driest of soils and the most unpromising of surroundings could deter us! It might take us a long time, but in the end we should have our garden, and it would be beautiful. Most of the truly delightful gardens were years in the making, their owners adding a few good things each year and arranging and rearranging until they were satisfied.

Why not begin our long-cherished gardens this spring? We would begin with annuals and perennials, buying good seed and raising the plants ourselves. We would gradually add bulbs and shrubbery and the other more expensive items as we could afford them. We would also gradually add to our rose collection until we had a garden of only the choicest varieties. Finally, we would plan and build our rock garden, lily pool and fountain. We might eventually pave the space around the pool with flagstones to form a sort of secluded outdoor living room wherein we could spend many happy hours in the summer.

Does this program sound too big? We admit it would be, if undertaken without proper thought and plans, and if we rushed in and tried to do it all in one season. We will grow and our ideas will change as we work with our gardens, and our gardens should grow with us. Remember, most good things have humble beginnings.

Make Plans First

The first thing we must do, then, is to make our plans. We may change them many times, later, but we need them now if we are to achieve an orderly effect. We will take a large piece of white paper or cardboard and draw the outlines of the house and the available lawn space, using a scale of one-fourth inch for each foot of actual space. We will study pictures of well laid-out gardens for ideas that we may apply to our particular problems. We will first lay out the general spacings for lawn, eventual rose garden and rock garden, or any other type we may be interested in. Then, we will take each main space and work out the details for shrubbery and smaller beds.

Let us work with the front lawn first. We will want beds against the house, with taller plants next to the house and smaller bushes in front. The bed should have an irregular out-

line against the lawn, as it will be too square and stiff looking if definitely oblong or square. The corners should have the effect of being "filled in." The bed borders should have a clean-cut edge, however, or they will not be neat looking. The beds directly against the house should contain evergreen shrubs, eventually, but we can manage with the less expensive annuals for the first season. We want evergreens because it is only through them that we can have any garden to enjoy in the winter, the season when we most need it.

All gardens should have a semi-secluded effect. You should have the feeling of "entering" the garden, just as you would "enter" the house. Therefore, the front lawn space would be more or less definitely set apart from the rest by flower beds and shrubbery. Usually higher shrubs and bushes are used at the sides than in front. Here again the beds should have irregular inner outlines, should seem to fill in the corners and should have neatly cut borders. The flowers will range from bulbs and low border plants on the inner edge to tall bushes and ornamental trees at the back. Here our perennials and some annuals will show to good advantage.

We may have one or two small beds in the lawn, but if the lawn space is small, we must be careful not to make it seem even smaller by numerous little beds. We may have narrow beds along the edges of walks and winding paths—in reality mere flower borders.

We will strive to plant different types of plants that will insure us flowers all spring, throughout the summer and clear up until frost comes. We may even change the flowers in certain beds, taking up bulbs that have died down and planting later blooming things in their place, thus providing a succession of flowers.

Rose Garden Separate Unit

Most of us have roses now. We may want to leave them where they are for the present, until we have some evergreen shrubs and trees to take their places in the front lawn border beds. If we are ready for the change this season, we will prepare the soil and then transplant the bushes in rows and beds with lawn spaces and paths in between. We will want to plant rambler roses, ivy or some other climbing plants to cover the fence around the rose garden. The rose garden would be "entered" from the lawn. We may have enough roses for a small part of the garden only, this season, but we can put dahlias or zinnias or cannas in the other beds for the time being. The rose garden must not be in the least shaded by trees or buildings or the roses will mildew.

The rock garden will probably be more or less shaded, and this should be considered later in choosing plants that will do well here. We will probably do very little to this part of our "landscape" the first season, though we can easily begin to gather lovely ferns and trailing plants from the woods, and to assemble nicely shaped rocks and boulders. We may start some ivy plants on the fences or walls, or trailing around tree bases. We may have some beds of annual flowers, if we choose those that thrive in more or less shady places. Rock gardens will be discussed fully in a later issue.

We will take all these things into

consideration and sketch in possible borders and beds in each of our gardens. We may want to try several arrangements. In general, we follow the most natural arrangement as suggested by the lawn space, the slope of the land, existing big trees, brooks, etc. When our plans are completed, we are ready to decide on the particular plants to put in certain beds.

Annuals Are Discussed

We will have to depend mostly on annuals for our blooms the first year. The giant-flowered zinnias are easily grown from seed and their gorgeously colored flowers make showy beds. Marigolds come in many types in all the rich orange and red shades. The African and French marigolds grow two feet in height, while the dwarfs are small and suitable for borders. Snapdragons come in lovely delicate colors and bloom profusely throughout the summer. They will seed themselves each year thereafter, requiring only thinning and transplanting. Nasturtiums are thrifty growers and continuous bloomers. You may have either the climbing or low bush type, or both. They will also seed themselves every year thereafter and furnish enough plants for the commu-

nity. Annual larkspur comes in all the pink, orchid and blue colors, sending up long spikes of delicate flowers. Larkspur grows about three feet tall and blooms all summer.

Salvia, or scarlet flowering sage, makes a wonderful showing all during the fall months until frost nips it. It is easily grown from seed, and attains a height of about three feet. Cosmos, if planted early, will bloom from August till frost. It comes in many lovely colors now, in three types of bloom—the ordinary yellow centered, the double-crested and the ray-flowered. Cosmos reaches a height of six feet under ordinary conditions and may grow much taller. Sweet peas are a problem in themselves and should be grown against a building or fence with some sort of trellis on which to climb. These, then, are the taller-growing annuals suitable for the back rows in the flower beds.

Among the annuals growing to a medium height are periwinkles, ageratum, balsam (very beautiful), mignonette, feverfew, lantana, Love-in-a-mist, four-o'clocks, asters, petunias, Dusty Miller Impatiens, salpiglossis, Sweet William, Stocks and

(Concluded on page 32)

Egg Dishes for April

EGGS and bunnies have come to be the symbols of Easter. They appear on gay-colored post cards to delight the hearts of children. We grown-ups content ourselves with all kinds of temptingly served egg dishes in recognition of the Easter season. Most folks of the feminine persuasion pay tribute in the form of new Easter bonnets. Anyway it is appropriate that we feature recipes for egg dishes at this time. They should prove useful throughout the year as well as during the Lenten season.

Poached Eggs

Have ready a frying pan two-thirds full of boiling salted water, allowing $\frac{1}{2}$ T. salt to 1 qt. water. Put two or three buttered muffin rings in the water, if you so desire. Break each egg separately into a saucer and slip into ring (if used). The water should cover the eggs. When the egg white is firm, remove carefully with a skimmer to circles or triangles of buttered toast. Let each person season his egg with salt, pepper and butter.

Eggs Au Gratin

Arrange poached eggs on a shallow buttered dish. Sprinkle with grated cheese. Pour over eggs 2 c. of tomato or white sauce. Cover with stale bread crumbs and sprinkle with grated cheese. Brown in oven.

Baked Eggs with Pimento Potatoes

To 2 c. hot rice potatoes, add 2 T. butter, $\frac{1}{2}$ c. rich milk and $\frac{1}{4}$ T. salt. Beat vigorously three minutes, add $\frac{1}{2}$ pimento, forced through a strainer, and continue the beating until mixture is well blended. Pile evenly on a buttered baking dish and make four cavities. In each cavity slip a raw egg. Bake until eggs are set.

Eggs a la Goldenrod

Hard boiled eggs $\frac{1}{2}$ t. salt
1 T. butter $\frac{1}{2}$ t. pepper
1 T. flour 5 slices toast
1 c. milk Parsley
Make a thin white sauce with butter, flour, milk and seasonings. Separate yolks from whites of eggs. Chop whites, finely and add them to sauce. Cut four slices of toast in halves lengthwise and arrange on platter. Pour over the sauce. Force the yolks through a potato ricer or sieve, sprinkle over the sauce. Garnish with parsley and remaining toast, cut in points.

Scrambled Eggs

5 eggs $\frac{1}{2}$ t. salt
 $\frac{1}{4}$ c. milk $\frac{1}{4}$ t. pepper
2 T. butter
Beat eggs slightly with fork; add salt, pepper and milk. Heat omelet pan, put in butter and when melted turn in the mixture. Cook until creamy, constantly stirring and scraping from the bottom and sides of the pan.

Eggs en Surprise

Cut stale bread in two-inch slices and then in circular shapes. Remove centers, leaving cases. Fry in deep fat until delicately browned and drain on brown paper. Half fill cases thus made with creamed asparagus tips. Poach an egg for each serving, coat egg with slightly beaten egg and roll in bread crumbs to which has been added grated cheese (2 T. cheese to $\frac{1}{4}$ c. crumbs). Fry one minute in very hot fat. Drain and arrange on a hot platter in the prepared nests. Garnish with parsley.

Plain Omelet

4 eggs 4 T. hot water
 $\frac{1}{2}$ t. salt 1 T. butter
Few grains pepper
Separate yolks from whites. Add to yolks the salt, pepper and hot water, and beat until thick and lemon-colored. Beat whites until stiff, cutting and folding them into yolk mixture. Heat omelet pan and butter sides and bottom. Turn in mixture, spread evenly, and place on range where it will cook slowly, occasionally turning the pan so that omelet may brown evenly. When well "puffed" and delicately browned underneath, place pan

on grate of hot oven to finish cooking on top. The omelet is cooked when it is firm to the touch and none of it clings to the finger. Fold and turn on hot platter. Allow one egg for each person and 1 T. of liquid for each egg. Milk may be used in place of water.

To Fold and Turn Omelet—Hold the omelet pan by handle with the left hand. With a case knife make two one-half-inch incisions opposite each other at right angles to the handle. Place knife under the part of omelet nearest handle, tip pan to nearly vertical position. By carefully coaxing the omelet with knife, it will fold and turn without breaking.

Omelet with Chicken or Ham

Bits of finely chopped cooked chicken or ham form a welcome addition to the omelet. They may be added to the yolk mixture and cooked in the omelet, or folded in when the plain omelet is ready for serving. Remnants of fish may be added and added to white sauce, and the sauce may be poured around the omelet on the platter.

Cheese Omelet

4 eggs $\frac{1}{4}$ T. salt
4 T. water Few grains cayenne
2 T. melted butter 2 T. grated cheese
Beat eggs slightly, add 1 t. butter, salt, cayenne and cheese. Melt remaining butter, pour in mixture and cook until firm without stirring. Roll and sprinkle with grated cheese. Serve with graham bread sandwiches.

Egg Sauce for Fish

$\frac{1}{4}$ c. butter $\frac{1}{2}$ t. salt
3 T. flour $\frac{1}{2}$ t. pepper
1 $\frac{1}{2}$ c. hot water or 1 t. lemon juice
fish stock 2 hard boiled eggs
Melt one-half butter, add flour and seasonings, and pour on gradually hot water. Boil five minutes, and add remaining butter in small pieces. Add two hard boiled eggs cut in one-fourth-inch slices. Serve with boiled or baked fish.

Egg Salad

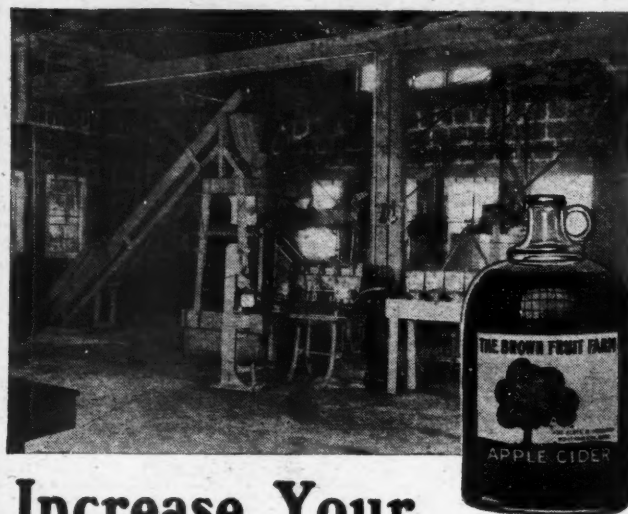
Cut six hard boiled eggs in halves crosswise, keeping whites in pairs. Remove yolks and mash or put through potato ricer. Season yolks with butter, salt, pepper, mustard and vinegar or a French dressing. Make into balls and refill whites. Garnish with a dash of paprika and arrange halves on plate on bed of lettuce. Garnish with roses cut from red radishes. Chopped cold chicken may be mixed with the yolks if there are some left-overs. For a fancy salad, the tops of the whites may be cut in small points in a basket effect. Serve salad with French or boiled dressing.

Fruit Souffle

$\frac{1}{4}$ c. fruit pulp—Whites 3 eggs
peach, prune or Sugar
apricot Few grains salt
Rub fruit through sieve; if canned fruit is used drain from syrup. Heat and sweeten if needed. Beat whites of eggs until stiff, add gradually hot fruit pulp and salt and continue beating. Turn into buttered and sugared individual moulds, having them three-fourths full. Set moulds in pan of hot water and bake in slow oven until firm. (Determine by pressing with finger.) Serve with whipped cream or a fruit juice sauce.

Table of Abbreviations

1 t. equals 1 teaspoonful.
1 T. equals 1 tablespoonful (3 t.).
1 c. equals 1 cupful.
1 qt. equals 1 quart.



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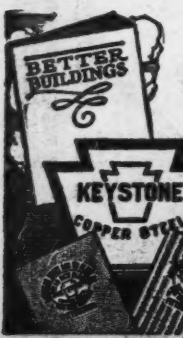
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Chats With Fruit Grower's Wife

(Continued from page 31)

lace flowers. Each has its characteristic colors, fragrance and type of blossom. The seed catalogs give pictures, descriptions and planting directions for every flower, and are a good source of information. There are many other annuals that the amateur grower may try for herself. Ye Editor just happens to be familiar with these and knows they are easily grown.

Border Plants Listed

Sweet alyssum is a profusely flowering border plant. Its white blossoms are fragrant and effective. Sand Verbena, Phacelia, Burning Bush, lobelia and cynoglossum are all good border annuals because of low compact growth. The lobelia and phacelia are blue, and are lovely in appearance but not so hardy and thrifty as the others. Burning Bush is flame colored while Sand Verbena is rose. Pansies are always favorites. They are shade-loving flowers.

We will want to start as many of our perennials this spring as we have space for, so that we will get some nice blooms next year. Annuals involve much work every year, while perennials have only to be started properly and transplanted once. With a little fertilizer, water and cultivation, they will furnish us with lovely flowers every year with little or no attention. Among the most beautiful are the delphiniums, which come single and double in many shades of blue, and throw up handsome tall spikes of luxurious flowers. Delphiniums are poisonous, however, so children would have to be guarded from them.

Delphiniums, hollyhocks, phlox, columbine, tritoma (red-hot poker plant), forget-me-nots, California poppies, verbenas and the fragrant wall flowers can all be easily raised from seed in small beds and then transplanted to their permanent places. Verbenas, phlox, California

poppies, tritoma and forget-me-nots should all bloom the first year if planted early.

Certain other perennials can be started best from the root. These include geraniums, primroses, lily-of-the-valley, Michaelmas daisies, flowering artichokes, hydrangeas, lupines, spice pinks, English daisies, violets and chrysanthemums. Dahlias may be started either from the seed or tuber. The tubers multiply greatly each year, and, as only one is needed for the plant, the next year the gardener will have many to dispose of.

Certain Bulbs Available

Iris, gladioli and cannas are bulbs which may be planted in the spring to bloom later in the summer and fall. Most of the other bulbs must be planted in the fall. We will discuss the planting of bulbs in a later issue of the magazine. Gladioli and cannas multiply rapidly and so are not extra expensive. Growers who have them usually are glad to trade with other gardeners.

Biennials, such as foxgloves and canterbury bells, must have a year in which to grow in order to bloom the second season. Therefore, the seed would have to be sown and the plants raised this year for next year.

The gardener should have no difficulty in selecting a few of each of the above types—the ones that meet her bedding requirements as to height and color and appeal to her most. She can find in the catalog of any reliable seed house what type of soil and growing conditions each requires. She should pick those that bloom at different seasons or continuously, and those that will bring about color harmony in the beds at any one time. She should try several entirely new plants each year, just for the thrill of watching them grow and bloom. Experiment in your garden and see what results you can obtain!

New Fruit Production Program for the Pacific Northwest

(Continued from page 12)

tions are that this variety has possibilities as a pollinizer."

Similarly pointed conclusions were reached concerning strawberries, sweet cherries and raspberries.

Practical Results Seem Satisfactory

The practical results of this trend toward a state program seem very satisfactory. Reports from one part of the state received by the writer recently are to the effect that just at the time of the county economic study there, a young boom was developing on date prunes. The figures brought out caused a cooling off of enthusiasm that has saved a good many people some money. In another district reports are that improvement of old orchards to increase yield has been more general in the past two years than ever before but that no new plantings are being made.

In the Rogue River Valley a thousand acres of apple trees were pulled out last year as a result of the crystallization of opinion. Sixty per cent of this acreage will, after two or three years in alfalfa, be replanted to orchards, but this time to pears, and the pears will be winter pears which grow particularly well in the Rogue River Valley, and for which there seems to be a fairly stable market capable of some expansion.

In Wasco county, where considerable study was given to the yields required to make apple orcharding profitable in the Pacific Northwest, contract was let the past winter for pulling of 54,000 apple trees. Most of this large block had been planted on land entirely unsuited to profitable apple production.

Four orchard districts report increases of better than 400 per cent in acreage cover cropped, since the

counties engaged in these economic studies.

Investigation of possibilities of reaching markets not now fully occupied by Oregon products resulted in two or three developments of considerable economic importance. One possibility seemed to be hitting the Portland market with green beans early in the season. Southern Oregon has several early districts, and demonstration plantings showed the entire feasibility of meeting this early demand. The Portland market usually breaks about July 20. Now many growers in the Grants Pass district are harvesting a ton of beans per acre prior to July 4. Net returns of \$100 to \$300 per acre have been common. A second development was sweet potatoes. From 400 to 500 carloads are used in the Pacific Northwest annually. Many of these come from California, and large quantities also come in from Arkansas. Three or four districts have taken up the growing of sweet potatoes, and last year 20 carloads of locally grown sweet potatoes were introduced to Pacific Northwest markets.

Lady—Tobe, I'm sorry to hear your wife got a divorce.

Tobe—Yessum; she done gone back to Alabama.

Lady—Who will do my washing now?

Tobe—Well, mum, I've co'tin' again, and I co'ts rapid.

A report of the Bureau of Commerce shows that 27,826 cider mills were manufactured in the United States in 1922, 28,691 in 1923 and 18,663 in 1924.

Starting a Bramble Plantation

(Continued from page 3)

April, 1925. The Lucretia and Mayes dewberries are standard. The Young is a new sort suggested as worthy of trial in the January, 1925 issue of the AMERICAN FRUIT GROWER MAGAZINE. The Cuthbert, King, Ranere and Herbert red raspberries and the Cumberland and Farmer black sorts are standard. The Latham variety has recently become a standard in Minnesota, and because it is widely adapted, and because large stocks of certified plants

more than six inches of cane above the leader buds on the red raspberry or blackberry, and if the black raspberry or dewberry tips show traces of anthracnose, cut the attached cane back to the ground.

In planting, a spade is commonly used to open a hole, and the roots are inserted. The plants should be set slightly deeper than they formerly grew, and then each should be packed firmly with the heel.



A good plantation of Logans at Salem, Ore. Note that the plants check in all directions; this greatly facilitates cultivation

have become available, it is worthy of wide planting.

Care of Plants and Planting

If the best grade of the best variety of bramble has been secured, the plants are valuable and should be properly cared for and promptly planted. If the plants are somewhat dry when received, they should be soaked in water

Because the plants must reach a certain size before they can produce profitable crops, every effort should be made to encourage rapid development of root and top for the first year at least. Where irrigation is needed, water should be applied; cultivation should be frequent; and if fertilizers are needed, liberal applications should be given. For the first year, stable



Black raspberry plants during the first year of growth, like this one, are called "creepers." By planting only the strongest "tips," growers can secure profitable crops from patches one year old. In like manner, dewberry, Loganberry and Oregon Evergreen blackberry plantations may be developed

for a few hours and "heeled in" in moist soil until taken to the field for planting. Land which was in a cultivated crop the previous year is much to be preferred to sod land. The field should be thoroughly prepared. The earlier the plants are set in the spring the better, provided the soil is fit to be worked, for root growth starts at low temperatures. The plants should become established in the ground before the arrival of warm weather, when the leaves demand a large amount of water from the roots. In some sections, where the winters are not too severe, fall planting is very successful with the red raspberry. The roots start growth at the low temperatures prevailing during the fall and spring, and such plants start growth in advance of spring-set ones.

The tops should be cut back close to the ground at planting. In fact, it would be much better to cut off all the cane above ground if it were not for the help which they afford in marking the rows. In any case, never leave

manure is probably the best fertilizer, if it can be obtained. Nitrate of soda, or a more slowly available nitrogen carrier, such as tankage or cotton seed meal, may be used instead of stable manure and should be applied before planting.

No pruning or training is necessary the first year—just thorough cultivation.

Planting distances vary with the variety of bramble and the conditions. For the erect-growing blackberries, three to eight feet is commonly used. The purple raspberry is set three to four feet by eight feet, and the black raspberry three to four feet by six, seven or eight feet. Where the red raspberry is to be grown in a hedge row, it should be set 18 inches to three feet by six to eight feet. Because of the increased size of the crop when the plantation is one year old, it will often pay to set the red varieties as close as 18 inches in the row. When grown in hills, red varieties are commonly set five by five feet.

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Engineering for the Fruit Grower

By E. W. Lehmann

Spring and Summer Care of Heating Equipment

TO MAKE possible the greatest measure of comfort in the winter, we must not neglect the furnace and heating equipment during the spring and summer. Some engineers and heating specialists contend that a furnace wears out faster during the summer than during the winter, largely due to the fact that it is not properly cleaned and cared for when out of use. The sooner this is done the better it is for the heating equipment.

Care of Stoves

Where stoves are depended upon for heat, just as soon as the weather permits, they are taken down and removed from the rooms. On account of the soot and ashes, this is a disagreeable task, and we think only of getting the stoves and smoke pipe out of the way when we are about the job. However, if the stoves and pipe are carefully cleaned and freed from soot and ashes and stored in a dry place, it will be worth all the effort in increasing the life of such equipment.

Fireplace and Chimney

The fireplace and chimney should come in for their share of attention. The walls of the fireplace may need renewing, and in any event it is desirable to clean the chimney of soot, especially if bothered with it falling down into the fireplace.

Inspecting the Furnace

It is even more important that the furnace be attended to at this time than the stove because of the greater investment and the desirability of having it in first class shape when cold weather sets in next fall. Unless the furnace is inspected, you cannot be sure of its condition. On spring and summer days, when it is not needed, is the best time to inspect it, and at the same time it can be thoroughly cleaned and repairs made. The plan of getting such equipment in first class condition when not needed is always the best practice.

It is not necessary to dismantle a furnace to clean it. However, it may become necessary if it is found that new parts must be put in and repairs made. It is always desirable to take off the smoke pipe and clean it out thoroughly and see that the chimney is clean where the pipe goes in. The pipe may be put back in place after the furnace is cleaned, but it is usually best to store it in a dry place and put a cap over the hole in the chimney. Many furnace pipes rust out much sooner than they should, due to the entrance of rain water during the summer months. In some cases water will flow through the smoke pipe and damage the furnace. In cleaning the smoke pipe, note its condition so that new pipe can be replaced if needed. There is always danger from fire whenever a smoke pipe is neglected.

Smoke Pipe Requirements

According to the standard regulation for installing smoke pipes for warm air furnaces—and the same would apply to other furnaces—the pipe should be made of either black or galvanized iron not lighter than No. 24 United States Standard gauge, and of the full size of the collar on the furnace throughout its entire length. There should be no opening into the furnace pipe for attaching a stove, hot water heater or other device. It would be well to keep these facts in mind because many times furnace troubles may be due to incorrect installation. Renewing a smoke pipe does not require the services of an expert tinner. The owner can cut the cost in half by securing the necessary pipe lengths and installing the pipe himself.

The Flue is Important

A cause of inefficient operation of a furnace is often due to a poor flue. If your furnace has been giving trouble, don't condemn it entirely, but inspect the flue and smoke pipe. A first class flue is smoke tight, extends at least two feet above peak roofs, is lined with a smooth flue lining, has no offsets, has no other opening for connecting other heating equipment, and is at least eight inches by eight inches in its smallest dimension. Check your flue for these requirements and see if it is at fault or if the trouble is in the furnace.

Cleaning the Furnace

In cleaning the furnace, free all surfaces of soot and ashes by means of scrapers and brushes. Be sure that all smoke passages are cleaned. Many furnaces give very poor results because they are not properly cleaned. If a cheap grade of soft coal is burned, the furnace and pipes will need to be cleaned more often than when a better grade is used. The clogging of the smoke passages checks the draft, having the same effect as a stopped flue, and causes the furnace to smoke; and secondly, the soot and fine ashes act as an insulating material and the heating results are very poor. Every furnace is designed so that there is a large heating surface in proportion to the grate surface. On one side of this heating surface are the flames from the burning fuel, and on the other side is the medium that is being heated and which transfers the heat to the rooms to be heated. In warm air furnaces this medium is air, in hot water and steam systems the medium is water. It can be readily seen that if the heating surface is coated with soot and ashes it would be very inefficient in the use of coal, so by all means remove all soot and fine ashes.

To keep the furnace dry, the practice of putting about a peck of unslacked lime in a box and setting it on the grate is often followed. Due to poor ventilation, the furnace room is liable to become more or less moist during the summer months, and the lime will collect the moisture and prevent rust. It is also desirable to have the furnace doors slightly open to allow the circulation of air through the furnace. This practice is especially good if the basement is dry.

Keep Gas and Smoke Out

Don't overlook cracks and air leaks in repairing the heating equipment. The cause of gas and smoke getting into the rooms being heated by a warm air heating system is usually a cracked fire pot, or it may be due to a poor joint where the parts of the furnace are joined together. If this is the case, get a high grade furnace cement, sometimes called iron cement, and see that all cracks are stopped. This cement can be worked into the joints or cracks with a putty knife or a small trowel. If the fire pot or fire dome of a warm air furnace is cracked, it is best to renew it before the next winter season.

Many times air leaks into the furnace jacket or warm air pipes carry a lot of dust from the basement to the other parts of the house. This can be overcome by the use of asbestos paper, which is inexpensive, and which can be applied with a special paste secured at a tin and heating shop. Ordinary flour paste can also be used with good results.

Keeping Records

MANY farmers conduct their business without accounts or records of any sort. This practice makes it impossible for them to tell where money is made and where it is lost. No sys-

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tem will in itself add money to one's income. It will, however, give a record of past performance, making it possible to change certain practices with the assurance that the change is good for the business.

Careful records on the tractor, the truck and the automobile are desirable. To determine the mileage secured per gallon of fuel with the car and the truck, or the fuel required per acre plowed with the tractor, will make it possible to study the economy of these machines. By carefully adjusting the carburetor, the fuel consumption may be still further reduced, resulting in the motor being in better operating condition and costing less to operate. Truck cost records show the economy of operating a truck, and it is possible to determine whether it pays to own a truck when compared with hiring the hauling done. It should not be overlooked that efficiency and economy in production go hand in hand with cost records.

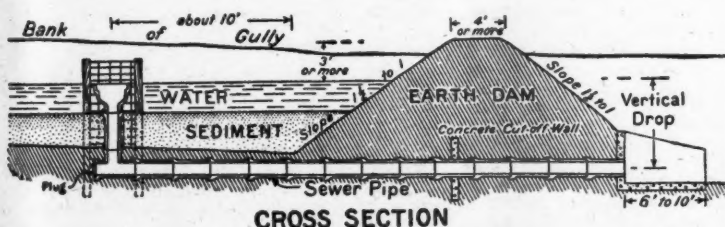
Stopping Gullies

MANY of the best fruit farms are on rolling and hilly land where soil washing and gullying is a big problem. Gullies can be controlled by soil saving dams and other devices if not neglected too long. Every effort should be made on the rolling farms that do not now have gullies to prevent the gullies from starting. This can be best done by increasing the absorptive capacity of the soil, by protecting the sloping surfaces with cover crops, and by providing terraces to check the flow of water.

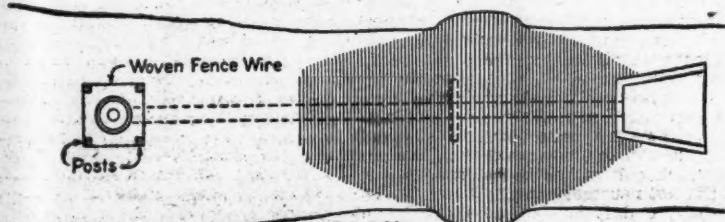
The soil saving dam is the most effective method of controlling and filling gullies. The most common method of building such dams is to use the material at hand without going to a great deal of expense. Temporary dams are built of brush, straw, logs, stones, woven wire, etc. Permanent dams are constructed of earth and masonry. The earth dam is the most common, and when all things are considered, it is no doubt the most satisfactory.

The most effective earth dam for saving soil is the type where the water is conducted through the dam by a sewer tile. This type of dam can be easily built at little expense as far as the dam itself is concerned. The cost of the tile is not a great item, since

covered by back water, this tile will not have to be as large as if there is little storage capacity. Farmers' Bulletin No. 1234 on "Gullies, How to Control and Reclaim Them," which may be obtained from the United States Department of Agriculture at Washington, D. C., specifies pipe sizes for different conditions. This bulletin gives a clear-cut discussion of many



CROSS SECTION



PLAN

Sectional side view of an overflow for an earth dam, and a top view of same

only sufficient length is needed to extend under the base of the dam and a short distance above it. A few dollars' worth of concrete will be needed to construct a cutoff wall and outlet partition as illustrated.

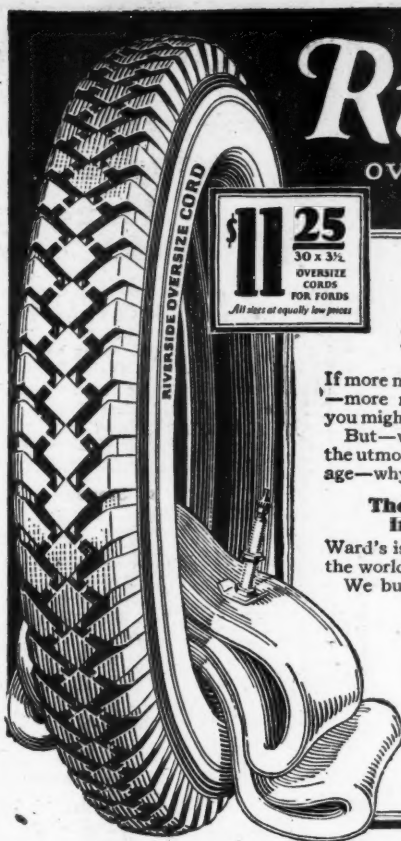
The design of this type of dam is shown. At the upper end of the tile, additional lengths of sewer pipe may be added as the silt fills in. The top of the dam should also be raised so that it will be kept several feet above the top of the inlet pipe. Special precaution should be taken to avoid selecting a tile that would be too small to conduct the water away. If there is considerable area that will be

methods of controlling soil washing. It should be secured by every farmer who has a soil erosion problem that is troubling him.

Fifty-fifty

A West Virginia dinky, a blacksmith, recently announced a change in his business as follows:

"Notice—De copardnership herto-fore resisting between Me, and Mose Skinner is hereby resolved. Dem what owe de firm will settle with me, and what de firm owes will settle wid Mose."—Walkover Press.



Riverside Tires & TUBES

OVERSIZE CORDS
BALLOONS

Your Saving is One-third

12,000 Miles Guaranteed on Oversize Cords

If more money would buy more quality—more miles of satisfactory service—you might consider paying a higher price.

But—when a "Riverside" gives you the utmost service—the last yard of mileage—why pay more money for a tire?

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Ward's is the largest retailers of tires in the world.

We buy our own new live rubber in the Orient—millions of dollars' worth at a time.

Riverside Tires are made in our own molds, under our own personal inspection. They are bigger, heavier, and stronger because we put into them more strength—more new live rubber, the finest materials.

A Fully Guaranteed Quality Tire

"Riverside" is a Quality tire. The low price is made by the lower cost of selling and not by saving on materials or labor. We use the finest quality materials—and guarantee Riversides equal to tires selling for \$5 to \$15 more.

A 54 Year Old Guarantee

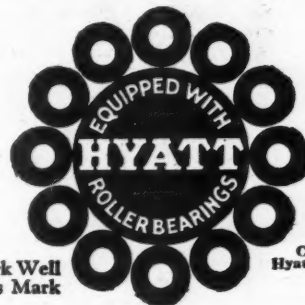
Since 1872 Montgomery Ward & Co. has been dealing with the American public under an iron clad guarantee. We could not put our guarantee back of this tire unless exceptional quality was put into the tire.

You cannot buy a tire with a better, older, more responsible name and guarantee. So why pay more money? Why not save one-third on your tires, too?

Montgomery Ward & Co.

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Mark Well
This Mark

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It's time you had a Planet Jr.

YOU have no idea of how much time and work Planet Jr. Drills and Wheel Hoes save—unless you have used them yourself. The Planet Jr. No. 25 Combination Seeder and Wheel Hoe, for instance, it does most of the garden work, from planting time up to frost; plows, plants, hoes, weeds and cultivates. No wonder it's called the "complete gardener".

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When You Poison Use a Peerless — A real hand Dust Gun

Apply dust insecticide and fungicide with a Peerless Hand Dust Gun and get results.

The load is divided front and rear—equally balanced. Easy to carry and easy to operate.

Fan is ball bearing and the hub is packed in grease. The hopper holds seven pounds and the discharge can be regulated from nothing to twenty pounds per acre.

Just the thing for plants, bushes and medium size trees.

Write for name of nearest dealer and mention this paper.

Peerless Dust Gun Co.
1600 E. 24th St. Cleveland, Ohio

Six Fine Apple Orchards in Patrick Co., Va.

(Approximately 3500 acres on which are approximately 80,000 trees)

Pursuant to order of the United States District Court for the Western District of Virginia, the real estate holdings of Patrick Orchards, Inc., bankrupt, consisting of six separate orchards of from 3,000 to 32,000 bearing trees each, will be sold, in whole or separately

At Auction

These orchards are located in Patrick County, on the slopes of the Blue Ridge Mountains near Stuart, Va., on the Danville and Western Railway (a branch of the Southern) where good labor is cheap and plentiful. No better fruit section can be found. Close to cold storage. All of these orchards must go to the highest bidder.

April 6, 1926, at 1:30 P. M., at Stuart, Va.

TERMS: One-third cash, balance in equal amounts one and two years, to be evidenced by two negotiable notes bearing interest at six per cent. per annum, payable semi-annually. Title retained until purchase money is paid in full.

We are anxious and willing to show this property before the sale. Free transportation from Martinsville to interested parties.

For Full Particulars, Write or Wire

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H. A. FORD & CO., INC.,
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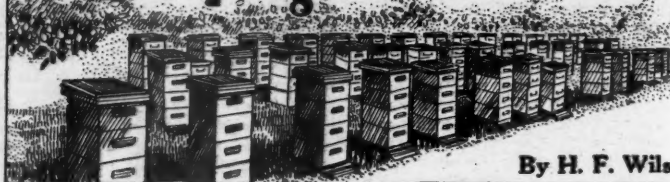
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all outside, each with bath, run-
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IN THE HEART OF CHICAGO

Bee Keeping for Fruit Growers



By H. F. Wilson

The Swarming Instinct and How It Can Be Reduced

THE TIME will soon be here when the beekeeper will be bothered with the swarming of his bees, unless he has taken precautions previously to prevent swarming. In years gone by, a beekeeper's ability was figured according to the number of swarms he was able to produce in a season, and, truly enough, this was an indication of a man's ability to build up good strong colonies, for strong colonies are those most likely to cast swarms. Nowadays, a beekeeper's ability is considered from the standpoint of his being able to have strong colonies and at the same time prevent them from swarming.

Experience has taught our beekeepers that swarming not only reduces the strength of a colony, but that the bees in the act of swarming carry away with them a considerable load of stores.

It is not a simple matter to prevent swarming, and hardly any beekeeper may be expected to reduce swarming to the zero point. The following schedule of manipulations, properly carried out, will be of great benefit in the prevention and reduction of swarming.

Head Colonies with Young Queens

It is quite important, to begin with, that the colonies be headed with young queens, and it is a very excellent practice to requeen each colony every year about the middle of July or the first of August. This will provide strong, young and vigorous queens for the next spring. The first important step in the spring is to see that the bees have an abundance of room at all times. A crowded condition of the hive is the main cause of swarming. The provision of plenty of room early in the spring before the instinct for swarming has developed is exceedingly important.

Give the bees plenty of stores in the spring and protect them from the cold winds. Then, as soon as the colony has five or six frames of brood, provide it with a second hive body, also containing some stores. This will give the colony an abundance of room in which to work and expand, and any crowded condition which may develop is at once done away with. With exceptionally strong colonies, it may be desirable to add even a third section for brood rearing.

In spite of all of these precautions, a certain amount of swarming is almost sure to occur. To avoid the loss of swarms, be sure that the queen in each colony has its wings clipped. It is not necessary to clip both sets of wings, and it is also unnecessary to remove more than half the wing. A satisfactory procedure to follow in clipping queens is to hold the frame on which the queen is found with the left hand. Then, picking the queen up by the wings with the right forefinger and thumb, place her between the thumb and forefinger of the left hand, so that she can be held by the legs with the body resting close against the finger tips. Be careful not to squeeze her body and thereby cause possible injury to her abdomen. A tiny pair of scissors should be used to clip the wings about half their length from the body. Be careful that one of the hind legs is not clipped off at the same time, as queens have the habit of extending their rear legs above the body when being held, and occasionally, while one is clipping the wing, a

leg will be cut off. This injury is irreparable and the queen will have to be replaced as soon as possible, because she cannot move about freely on the combs during the process of egg laying.

If the queens are clipped and swarms attempt to leave, the queen, being unable to fly, will drop on the ground in front of the hive, and the swarm, after settling and finding itself queenless, will gradually return to the old home. If it is desired to retain the old queen, she may be put back into the hive, the queen cells cut out, and the brood and combs shifted into another hive body above the new one, with full sheets of foundation. This will provide plenty of work for the colony and will reduce somewhat the tendency to swarm immediately.

It will be desirable, however, to watch such colonies. About every nine days they should be examined for queen cells. The original part of the colony in the upper story should be examined about five days after the change is made and all queen cells found at that time destroyed.

These preparations are all made previous to the beginning of the honey flow. Supering for the honey flow will be discussed next month.

Why Bees Are Necessary in the Orchard

For those who have not tried the experiment, it is suggested that when your fruit trees are about to bloom, you select a few clusters of flowers and just before the petals open, cover them with paper sacks. Tie these carefully around the twig, so that no insects can get in and distribute pollen to them. At the same time, locate a number of uncovered clusters of flowers, to be compared with the covered clusters. After the petals have fallen, break open the sacks on the covered clusters and make observations on both the covered and uncovered clusters to see what the results are in the set of fruit.

Under normal conditions, distinct differences will be observed, showing a benefit to those clusters which were free to be pollinated by insect visitors. There are many fruits which cannot be pollinated within their own flower and it is absolutely necessary that pollen from other flowers of the same kind be carried to them, either by the wind or by insects. Investigations made during the last few years show that the wind does not play a very great part in the distribution of pollen on fruit blossoms. Observations made at the same time regarding the value of insects as distributors of pollen show that they are effective distributors of pollen and are nature's most important factor in cross fertilization. The honeybee is the most important distributor of pollen.

A REPORT of the Department of Commerce shows that the following numbers of spraying outfits of different kinds were manufactured during 1922, 1923 and 1924:

	1924.	1923.	1922.
Spraying outfits, hand, complete (with tank, barrel, knapsack, etc.)	144,029	191,572	80,871
Spraying outfits, power, complete (not including engine)	8,232	12,045	11,051
Spray pumps, hand, not included above	78,640	101,928	101,853
Spray pumps, power, not included above	3,961	11,840	6,013

Propagation of Fruit Plants

(Continued from page 7)

during the slack season and partly to get rid of a large amount of field budding during the summer time when other work is pressing. A stand of from 80 to 90 per cent from root grafts is considered good.

Plums are generally grown in the nursery row for two years after budding. Some of the hybrid plums have shown such extreme vigor that they are often dug at the end of the first season following budding and sold as one-year-old trees, as is the case with peaches.

Propagation of the Cherry

A lively controversy has been running for a number of years regarding the most satisfactory stock for propagating cherries. Two stocks have been commonly used. The Mazzard stock is made up of seedlings of the sweet cherry, *Prunus Avium*, as it grows in its wild state. The seedlings of this stock are long lived and grow naturally into large trees. The fact that they do not sucker badly and make vigorous nursery trees as well as orchard plants are points in their favor. The disadvantages of Mazzard stock lie in their lack of hardiness for northern conditions and in their being somewhat difficult to bud with a high percentage of success. The Mahaleb stock, perhaps more generally favored by nurserymen, is a small tree or bushlike plant when grown naturally and does not produce an edible fruit. It propagates readily from seed, however, and is somewhat harder than the Mazzards and furthermore is much easier to bud. Nurserymen can usually make a higher percentage of buds set in Mahaleb than in Mazzard. It is true that it dwarfs the tree somewhat, but this dwarfing is not noticeable during the years in the nursery. From a commercial standpoint, it is quite possible that a slight dwarfing is beneficial in cherries. In any event, it has not so far been considered a serious handicap. Neither Mahaleb nor Mazzard cherries are quite hardy enough for the most northern districts in which certain of the hardy Russian cherries are grown. For such districts it is probable that either seedlings of the Russian cherries, like Vladimir or the wild pin cherry, will make the best stock. An objection to pin cherry seed is found in the fact that it frequently requires two years for germination. Sandcherry seedlings have been recommended, but results have generally proven to be disappointing.

Cherry trees are almost universally grown two years in the nursery row after budding. This produces a strong, well branched tree which is apparently transplanted with greater success than one-year-old stock. Budding is the universal practice and grafting is rarely, if ever, attempted.

Propagation of the Apricot

This delicious but not commonly grown fruit is so nearly like both the peach and the plum that it can be propagated on stocks which are satisfactory for either of those fruits. The most common stocks are peach and apricot seedlings. The Myrobalan plum seedlings are also used successfully, and the western sandcherry makes a very satisfactory stock, especially if a slightly dwarfed tree is desired. The apricot on peach stock can generally be produced to marketable size in one year from the bud. As with other stone fruits, budding is the commonly accepted method of propagation.

Removing Old Orchards

THE REMOVAL of old orchards is a problem with many growers. Can the work be done effectively by man labor or can explosives be employed to advantage? The following information on the subject, collected at the Townsend Orchard Company, Inc., at Georgetown, Del., was sent us by E. I. du Pont de Nemours and Company, Wilmington, Del.

"The apple trees, which were the basis of the work, were 14 years old and averaged 10 inches in trunk diameter. Costs were kept on the chopping method, the tractor method and the dynamite method of removing trees.

Chopping Method

"The chopping method consists in chopping off the trunk close to the ground and leaving the butt. One man cuts an average of 40 trees per day. After the trees are cut, they are pulled away by a tractor, trimmed, piled for firewood and the brush burned. Three men and a tractor can handle an average of 72 trees per day. Allowing 75 cents per hour for the tractor and 25 cents per hour for labor, the average cost per tree removed is 27 cents with the stump still in the ground. The practice of leaving the butt in the ground interferes with plowing, turning under leaves for scab control and cover cropping. In addition, root rots may become established and spread to adjacent trees.

Tractor Method

"The tractor method consists in removing the trees by tractor pull. A high powered caterpillar tractor used in this work costs about \$1.25 per hour for operating. Three men are necessary for this method. An average of 12 trees per hour can be removed at an estimated cost of 17 cents per tree. For additional work of pulling out of the orchard, trimming, piling and burning brush for completed work, an additional expense of 21 cents per tree is to be added, making a total cost per tree of approximately 38 cents for comparison with the chopping method. The advantage of this method is the removal of the stumps. The disadvantage is the amount of soil removed by adherence to the roots and butt, and this would increase the expense per tree if soil was removed by labor. Injury to adjacent trees will result by this method unless some trimming is done before removal from orchard.

Dynamite Method

"The dynamite method consists in placing one stick of dynamite under the tree. The expense of boring, dynamite, fuse, etc., amounts to approximately 11 cents per tree. The tree is sufficiently loosened so that it is easily removed by a small tractor when pulled out of the orchard to the brush pile. Additional expense for pulling, trimming and burning of 21 cents per tree is to be figured, making a total cost of 32 cents per tree.

"This method removes the soil from the butt and lateral roots for a distance of one or two feet and therefore has an advantage over the caterpillar tractor method. The size of the hole caused by blasting is no greater than by the caterpillar tractor method, and probably the soil would settle sufficiently following spring cultivation that no handicap would be experienced in spraying operations."

Problems in Peach Crowing

(Continued from page 4)

large scale, club orders with your neighbors. Do not build houses or buy tools and equipment unless it is absolutely essential to operation. Many people buy themselves poor. Use standard materials and equipment that you can get service on. Grow feedstuffs for the farm animals when land is available and where it will not cause neglect of the major project.

To be successful in fruit growing one must practice the best methods known. His organization should not be top heavy with unnecessary expense and should function efficiently. Per acre production should be increased by fertilizers and cultivation, and pest damage should be reduced to a minimum.

That Prince of Wales is a lucky bird. Suppose, for instance, that he had taken up aviation.—Davenport (Ia.) Democrat.

SAFEGUARD Your FRUIT INVESTMENT

Your Orchard—apples, pears, stone fruit, grapes, berries—represent a definite investment you have made.

The Land they occupy, i.e., its assessed value, represents another.

Your Time spent in spraying represents perhaps the most important one of all.

And your Spray Rig is still a fourth.

Question—Does it pay to jeopardize this big composite investment of yours by using unknown or untried Spray Materials?

Specify Grasselli Insecticides and Fungicides—and CERTAINTY.

ARSENATE OF LEAD CALCIUM ARSENATE LIME SULPHUR
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THE GRASSELLI CHEMICAL COMPANY, CLEVELAND
Founded in 1839

GRASSELLI GRADE
A Standard Held High for 87 Years

The better your spray materials
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For sure results from your investment in spraying you must start right—by buying spray material that you know will be 100% quality. There's no surer way to satisfaction than standardizing on



ORCHARD BRAND INSECTICIDES AND FUNGICIDES

Not alone because you have known them for 20 years—but because they are being manufactured to 1926 standards of quality and uniformity which make them your most effective crop insurance.

And on the basis of that effectiveness Orchard Brand Quality Products are the least expensive in the end. Confirming the judgment of thousands of other growers, American Fruit Growers, Inc. have made them the standard for all spraying in their far flung orchards.

You will profit by doing the same thing!
Your dealer will tell you so too!

GENERAL CHEMICAL COMPANY
NEW YORK ST. LOUIS SAN FRANCISCO LOS ANGELES



Picking bigger profits

MORE fruit, better fruit, earlier fruit, quicker profits—are what you get from trees planted in blasted holes.

Farmers and orchardists all over the country have proved to their entire satisfaction the wisdom of planting their trees in dynamited ground.

Blasting causes a year's earlier return on your investment by speeding up development. It also makes the ground more absorbent—moisture is stored for the dry seasons which are the cause of first-year losses in the new orchard. You get more and better fruit in less time.

See your dealer for du Pont—the dependable dynamite, and don't fail to send for free book—new edition—"Farmers' Handbook of Explosives," showing how to use dynamite to plant your trees, clear your land of stumps and boulders, and blast your ditches. Write the nearest du Pont branch office below.

E. I. DU PONT DE NEMOURS & CO.

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Profitable Poultry

By Ralston R. Hannas

Mash and Grain

ALMOST any kind of an animal that wears feathers will lay in April. However, it is just as important to feed for eggs this month as for any month in the year, for there are other months to follow when it is desired to get eggs. On a good many farms, it is the custom to feed grain alone to the hens. Grain is important, but a dry mash, composed of some of the concentrates, is just as important where egg production is concerned. During the month of April, the hens should be getting at least 12 pounds of grain per 100 birds per day, a good grain ration being one composed of equal parts of cracked corn and wheat. This grain should be supplemented by a dry mash, to be kept before the birds at all times. A good dry mash is one composed of equal parts of wheat bran, wheat middlings, corn meal, ground oats, and meat scrap; or any good commercial scratch mixture may be used instead of the one mentioned and any good commercial dry mash mixture may be used in place of the one suggested. The amount of mash consumed by the birds is regulated by the amount of grain fed, and if the amount is fed as suggested, the proper amount of mash will be consumed if left before them all the time.

This mash should be kept before them every month in the year, and the birds should be encouraged to eat more of this as the summer months come on, cutting down on the amount of the grain fed so this extra mash consumption will take place. For example, only 10 pounds per 100 birds per day should be fed during the month of May, so an added amount of mash will be eaten. The grain is the food that nourishes the body and keeps up body weight, while the mash is the egg producing part of the ration.

bird's body, thereby hastening the digestive actions and therefore permitting of an increased digestion of food and a greater consumption of food. What enzymes are not needed in the digestion of feeds are carried off through the intestines and no harm is done by feeding too much.

The enzyme used in the experiments mentioned above was one known as protozyme, that aids in the digestion of both starch and protein. It is very similar to middlings in appearance, and is fed in the dry mash. The experiment included five lots of 200 chicks each. One lot was fed protozyme at the rate of five per cent of the amount of mash fed, another three per cent, another two per cent, a fourth one per cent, and the fifth pen received none of the enzyme. All the pens receiving the enzyme beat out the pen not receiving any, the five per cent pen leading them all. This pen at the end of the tenth week was 0.4 of a pound per chick heavier than those getting none of the protozyme, while at the end of the twentieth week, when the pullets were put in the laying houses, this pen was 0.59 of a pound per bird heavier than those not getting any of the enzyme—or a trifle over a half pound heavier. Moreover, it took only 0.46 of a pound extra feed to produce this added weight. The cost of this added weight, including the cost of the protozyme, was less than 12 cents per pullet. The mortality was much lower in the pens getting the protozyme than in the check pen which received none, the actual figures for the first seven weeks of brooding being five in the five per cent pen, four in the three per cent pen, 10 in the two per cent pen, 11 in the one per cent pen, and 16 in the check pen. Also, duplicate tests upon material taken from the crop and gizzard of chicks at the end of the sixth week of age indicated increased starch and protein digestion in individuals consuming the enzymes over those not consuming the enzymes.

Buckwheat Hulls As Litter

THE PROBLEM of what to use as chick litter arises each year, and sometimes it is settled satisfactorily and sometimes it is not. Various materials are used, such as fine cut alfalfa, cut straw, chaff and sometimes shavings. Any of these is good, with the exception of the shavings. The cut alfalfa is not always available, the chaff is apt to be too dusty, and the straw is apt to get into the chicks' eyes, causing watery eyes. The dust from the chaff will cause this too. The fine cut alfalfa, or alfalfa chaff, is as good as any of these mentioned.

In the past year or two, another material has come to the front as a mighty fine chick litter, and that is buckwheat hulls. These hulls are light in weight, clean, free from dust, and absorbent. Best of all, perhaps, they are cheap, being only a little over \$12 per ton. It has not been noticed that the chicks eat much, if any, of these hulls. Buckwheat is not good for chicks when fed in the grain form, but the hulls do not seem to be injurious in any way. They are worth trying.

Feeding Enzymes to Chicks

LAST spring the New Jersey Agricultural Experiment Station carried on some experiments with the feeding of certain fungous enzymes to chicks and growing stock which were very successful. The question may immediately be asked, "What is an enzyme?" An enzyme is an agent that aids in the digestion of various kinds of foods. For example, certain kinds of enzymes act on the starches in the feed, others act on the protein, others on the sugars, others on the fats, and so on. These enzymes are not forcing, as might be supposed, but merely add to the number of enzymes that are naturally in the

feeding not only of poultry but of other forms of livestock, for there is apparently no question that the desired elements in the feed are made more available by the addition of various enzymes. There is no trick in mixing them in the mash, and no technical knowledge is required to feed them. Furthermore, there is no danger in feeding them, since they are not stimulants, producing an exhilarating effect to be followed by a depressing effect, and if more are given than are needed, there are no bad effects, since they pass off through the intestines.

Broody Hens

POUULTY keepers will undoubtedly be troubled with broody hens during this month, especially if they keep any of the heavier breeds of chickens, such as the Plymouth Rocks, Rhode Island Reds, Wyandottes, Orpingtons, or any similar breeds. It is, of course, a natural process, which should be broken up speedily if eggs are desired, for the quicker they are broken, the quicker they will start laying again. The longer they are permitted to remain broody, the longer it will be before they start to lay again after they are completely broken up.

Various methods have been suggested for breaking up this broodiness, such as plunging the birds in a pail of water, and methods equally as cruel and useless. One of the best ways is to confine birds in "broody coops" as soon as the first signs of broodiness appear. A broody coop is an ordinary coop with a slatted bottom. It may be any size, being just large enough for one bird or large enough to hold several. This is purely a matter of personal preference. They should be, however, at least a

foot and a half high, so a bird can stand up comfortably. The idea of the slatted bottom is to make it uncomfortable for the hen to sit. It may take from three days to two weeks to break up broodiness by this method, depending entirely upon the individual hen.

Hens that are wanted for setting purposes, however, should rather be encouraged in this respect, removing them to a secluded place where they can have a comfortable nest. Do not set any eggs under them until it is certain the broody instinct is thoroughly developed. The eggs should be put under them at night, and any changing that is necessary after this should be done at night. After they have been started with the eggs, however, it is not advisable to move them at all.

Coccidiosis

THERE is a disease which affects young stock from about six weeks of age until maturity, known as Coccidiosis.

Stop the Gullies

(Continued from page 7)

is to take care of the water which falls between it and the terrace above. Also the function of the terrace is to carry the run-off to the outlet at such a speed that as much as possible will be absorbed by the soil and still at such a rate that there is no danger of overflow. It is well to discharge this water into a sodded area or into a wooded strip.

Lay Out the Levels Carefully

In laying out the terrace, the use

flow over the terrace, while a dip will in all probability fill up shortly.

Cultivate Across the Slopes

In cultivating a terraced slope, the cultivation should extend across the slope or be made to conform to the contour of the terraces as much as possible. While this is not always so convenient, still, rather than lose an otherwise useful piece of land, some little inconveniences may easily be tolerated. Furthermore, cultivation,



A completed Magnum Terrace

of a drainage-level will make it easy to locate the proper grades. The levels are started at the outlet and stakes usually driven every 50 feet. The actual construction of the terrace requires but few tools which are not on the average farm—extra equipment can usually be borrowed or rented. The top terrace is built first because completing the lower ones first only makes them subject to overflow. In case rainy weather should set in before the higher terraces are completed. If the soil is fairly loose but little plowing will be necessary. Usually eight or 10 furrows are thrown together and then the soil is pushed to the center with a grader or ditcher. The top of the terrace should be from a foot to a foot and a half higher than the low place above the terrace. A home-made V-shaped drag is useful in building up the terrace. Where extended across gullies it is best to build the terraces a little higher and make them stronger.

When finished, the terrace should resemble a road leading around the hill. The terrace should be smooth and compact with no dips or high places. High places are apt to be more damaging than low places, as a high point serves as a dam which will hold the water back and cause it to

as suggested, will help materially in preserving the terraces.

The terraces will require a little attention each year, especially so the first year. Sometimes the terraces are allowed to sod over, but unless the slope is too steep, they may be cultivated with but little danger. The main thing is to keep a lookout for low places and to keep the channels above the terraces fairly clean.

While the Mangum Terrace is not a "cure-all" as regards the problems of erosion, still by its proper use much land which is practically abandoned may be reclaimed to become profitable farm and orchard land.

AMERICAN FRUIT GROWER MAGAZINE: I have just finished reading the February issue of your wonderful magazine and I think it is the best ever. I sent in my three-year renewal a few weeks ago, but this one issue is worth the whole price to me.—O. W. Keller, West Virginia.

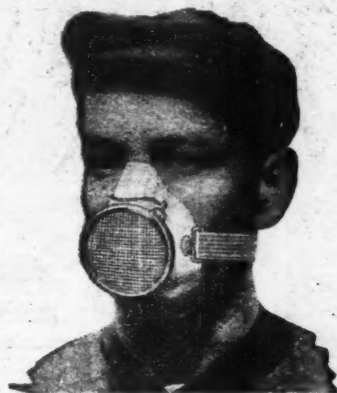
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Woman—Yes.

Farmer—Be ye the woman?

Woman—Yes.

Farmer—Well, then, I think I'll keep Maggie.



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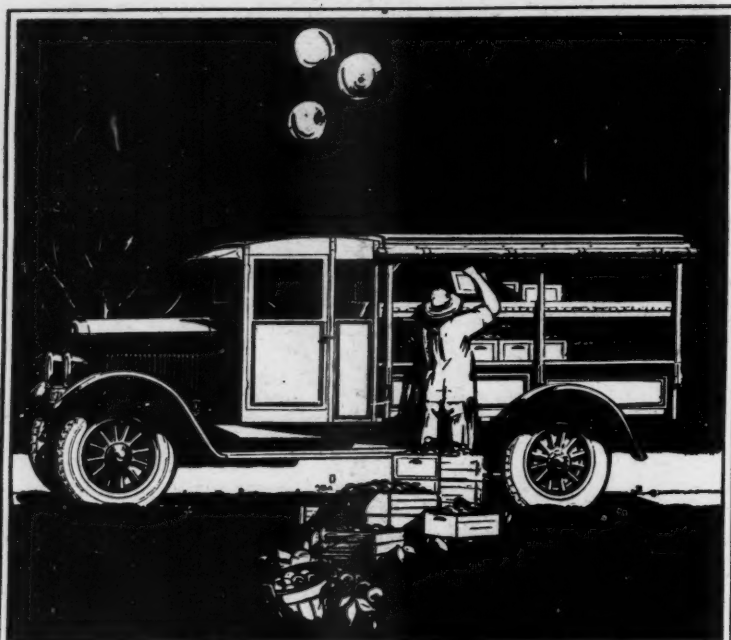
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New Tropical Fruits in Florida

(Continued from page 10)

for no tree of this species, so far as is known, has ever grown to fruiting size in California. Ordinarily the star apple fruit is round, but it is sometimes oblate, ranging from two to four inches in diameter, like a small to medium-sized northern apple. In some varieties the somewhat glossy, smooth surface is of dull purple hue, while in others it is light green. The flesh is sweet, melting, and pleasantly flavored, and it is comprised in eight translucent, whitish segments in which the seeds are embedded. When cut in two, the segments present a star-like appearance, whence the name. It is eaten fresh but makes wonderful preserves. An analysis showed the ripe fruit to contain:

Total solids	11.47 per cent
Ash39 per cent
Acids12 per cent
Protein	2.32 per cent
Total sugars	4.40 per cent
Fat	1.38 per cent
Fiber	0.85 per cent

The Paw Paw or Papaya

One of the Caribbean fruits that has spread all over the tropical world

papaya trees in Florida have been known to spring from seed to blossom in less than 12 months. The fruit oftentimes grows in such heavy bunches that it kills the tree. Fifteen or 20 papayas are not uncommon in a single bunch.

While entirely successful in the southern part of Florida, the papaya can also be grown, in protected situations, where light frosts are experienced. Because of its high productivity, rapid growth, and appetizing quality, it is predicted that this fruit will some day be much better known in the United States.

The Mangosteen, "The Prize of the Indies"

Perhaps no tropical fruit, not even the mango, has been so highly extolled as the mangosteen (*Garcinia mangostana*, L.). Though it is still far from the point where its commercial possibilities can be appraised, a number of orchardists have raised a few trees near Miami and to the south, and even include it in Christmas boxes of fancy fruits. It may be that it cannot be raised in quantities as far north as this country. It has been called "The Prize of the Indies," "The Queen of Fruits," "the finest fruit in the world," "a sip of nectar and ambrosia." The mangosteen "grows on a small tree rarely over 30 feet high. The fruit is very attractive but even more beautiful when cut. The rind is thick and tough, and it requires a circular cut with a sharp knife to lift the top half off like a cap, exposing the white segments, five or six in number, lying loose in the cap." The cut surface of the rind is of a delicate pink hue, while the segments of the fruit, enclosed by the rind, are very white or pale ivory. The texture of the fruit suggests a ripe plum, and it melts in the mouth. The flavor is delicious.

The mangosteen comes from the tropical Orient, particularly Java and Sumatra. From the opposite side of the world, namely, South Africa, comes the carissa or Natal plum which has become fairly common in southern Florida and has also been found to succeed in southern California. The fruit is used for jellies and preserves, and the plant is frequently used for ornamental purposes.

The Sugar Apple and Rose Apple

The sugar apple and rose apple must not be confused with the star apple already mentioned. There is also a fourth fruit called the custard or alligator apple, which grows in the Everglades and also in West Africa and other countries. The custard apple, however, has no value as a fruit, though it can be used as a stock for grafting the sugar apple. The latter (*Annona squamosa*) is yellowish-green in color, two or three inches in diameter, with a tender white pulp, sweet and slightly acidulous in flavor (according to the lexicon of tropical fruits, I have never eaten one), and it "unites to a most agreeable sweetness, a most delicious fragrance, like rose water." This is a desert fruit which in Florida ripens six months of the year. The rose apple is an ornamental member



A three-year-old plant of *Monstera Deliciosa* grown at Miami, Fla. The fruit rarely sell for less than \$1 each. The sections of the fruit are borne on an inedible core, like grains of corn. The core sometimes reaches 18 inches in length

where it is now one of the most common in tropical countries is the paw paw or papaya (*Carica papaya*, L.) which, however, must not be confused with the northern paw paw. I have eaten it in Hawaii, and it also furnishes one of the most popular desserts in Brazil, and in many tropical countries it is used as a breakfast fruit in much the same manner as a muskmelon or cantaloup is used in the United States. When sliced and served with sugar and whipped cream, it is delicious. It contains a milky juice in which an active principle, known as papain, is present. This enzyme greatly resembles animal pepsin and has become an article of commerce, being a valuable remedy in dyspepsia. The papaya can be grown in great numbers wherever the climatic conditions are favorable. It springs up everywhere in the Florida Keys, growing in the hammock land and sandy soil in Florida as freely as apple trees in the North. Its rate of growth is extremely rapid. Dr. Fairchild of the United States Department of Agriculture, who has spent considerable time in Miami, found that seeds of the papaya when planted in a greenhouse in February, produced young seedlings large enough to graft some time in March. Indeed,

for April, 1926

Magazine
Florida

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One of the first things they found
out was that about half the cost of
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came under the heading "Labor."
This fact caused them to check up on
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crop. This led to further studies and
the compilation of tables of averages
for the guidance of all growers.

For four consecutive years the
Stanislaus County Farm Bureau, in
co-operation with the agricultural ex-
tension service, promoted peach
growers' contests. In 1925, detailed
records of all operations and costs
were kept on 60 blocks of trees so
that statistics could be compiled for
orchards of all ages. The agricul-
tural extension service took the lead
in the cost studies and Prof. L. W.
Fluharty, Farm Management Special-
ist of the College of Agriculture, Uni-
versity of California, has compiled
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duction costs.

Various Items of Cost
Taking the records of 16 full bear-
ing orchards, Fluharty compiled the
following data which give the average
per cent of cost charged up to each
item constituting a production ex-
pense. Under the heading "General
Expense Not Included Above," he in-
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work as cleaning out irrigation
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and other general expenses. In fig-
uring depreciation, the value of an
acre of trees at six years of age was
fixed at \$350 and the average life 20
years.

Items. Per cent of
total cost.
Labor 49.9
Spray material 1.5
Water, tax 1.8

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of the myrtle family bearing a small
affricot colored fruit one to two inches
long. The fruit exhales a delicious
fragrance like that of the rose,
whence its name. The fruit is crisp,
juicy, and sweet as a preserve or
crystallized.

The White Sapote

The white sapote (*Casimiroa edulis*)
has been fruited at the United States
Plant Introduction Garden at Miami
but has not been extensively culti-
vated yet. The fruit is described as
most delicious, of soft melting tex-
ture, and sweet or slightly bitter
flavor. The flesh is yellowish and
there are five large oval or elliptical
seeds.

Miscellaneous Fruits

Before completing the story, there
might be mentioned the canistel, a
rich, very sweet fruit, of muskmelon
fragrance, and the cashew, a relative
of the mango. The canistel is not as
important as the cashew, which has
the distinction of furnishing both a
fruit and also a nut which is an im-
portant article of commerce.

The canistel has a yellow skin, and
bright orange flesh which is soft and
mealy in texture. The fruit is round
or oval in form and grows from two
to four inches in length. The tree
grows as far north as Palm Beach.

The more important cashew is the
source of a much prized wine which
is manufactured on a commercial
scale in Brazil. The fleshy part of
the fruit is called the cashew apple,
to distinguish it from the true fruit
or cashew nut. The apple reaches
three and one-half inches in length,
and its skin, which is very thin and
easily broken, is commonly brilliant
yellow or flame scarlet in color, while
the flesh is very juicy and light
yellow. The nut, which is an article
of commerce, is about an inch long.
It must be roasted before the shell
can be bitten in two as the shell of
the fresh cut contains acids which
burn the mouth and lips.

It would be wearisome to enter into
an account of all the many tropical
fruits, trees and grasses which are
finding a new home in the American
tropics. It would take many pages
to describe the scores of tropical
fruits that may prove adapted to a
new home in America. As an example
of the multitude of tropical fruits and
vegetables unknown to the United
States, may be given the statement
of the commercial representative of
the government of Colombia, who
says that in the market place of
Bogota he can point out 50 fruits and
vegetables that the average Ameri-
can has never heard of.

Peach Production Costs

By C. Verne Scoggins

WHERE is the expense in produc-
ing peaches? This was the big
question peach growers of Stanislaus
county, California, determined to an-
swer. They wanted first to know
how much it cost to produce peaches
in their county, and they went a
step farther and prepared detailed
records so they could explain exact-
ly where the expenses were created.

Labor Constitutes About Half the Cost

One of the first things they found
out was that about half the cost of
producing peaches in their county
came under the heading "Labor."
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fixed at \$350 and the average life 20
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Items. Per cent of
total cost.
Labor 49.9
Spray material 1.5
Water, tax 1.8

County tax	2.1
Miscellaneous expenses	0.3
General expenses not included above	12.4
Depreciation on improvements other than trees	0.3
Depreciation and interest on equipment	5.6
Depreciation and interest on orchard	12.6
Risk of doing business	13.0

Labor Hours For Various Operations

Since nearly half of the expense of
production of the crop was incurred
by labor costs, Fluharty compiled
some average figures to show the
number of man, horse and tractor
labor hours for each operation, and
likewise the per cent of the total
labor cost incurred by each opera-
tion.

LABOR HOURS PER ACRE

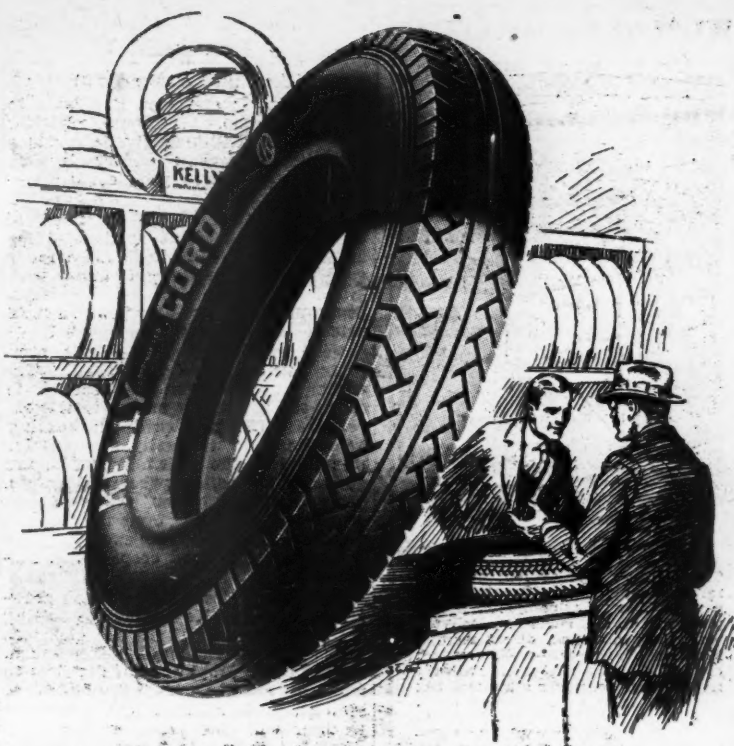
Operation	Man	Horse	Trac- tor	Per cent of total labor costs
Pruning	53.7	4.2	..	12.8
Brush dis- posal	9.6	11.3	..	2.2
Spraying	14.7	8.1	..	5.2
Plowing	3.2	6.4	1.4	1.3
Irrigation	10.7	5.9	..	2.7
Cultivation	13.5	10.3	8.8	11.5
Thinning	77.3	16.6	..	20.4
Pruning	5.1	4.3	..	1.3
Picking	116.0	21.1	..	30.4
Hauling from orchard	11.2	23.1	..	1.0
Hauling to cannery	3.6	5.2	1.0	10.3
Cover crop	3.6	5.2	1.0	1.1

Many of these orchardists thin
their crops from wagons, which ac-
counts for the number of hours during
which horses were required for that
operation.

To show the influence manage-
ment can have on labor costs, Flu-
harty figured out the following table
which shows the average costs for
each operation in the 16 orchards and
compares these costs with the costs
on an individual exceptionally well
managed orchard. Incidentally, no
one of the 16 orchards on which data
was tabulated can be considered a
poor orchard or a mismanaged or-
chard.

Operation	Average cost	Individual example
Pruning	\$20.00	\$14.13
Plowing	3.40	4.35
Irrigation	4.34	1.98
Cover crop	2.30	1.74
Brush disposal	4.85	1.98
Cultivation	18.55	7.49
Thinning	31.87	14.00
Pruning	3.12	..
Picking	48.56	33.40
Hauling in orchard	4.02	..
Spraying	8.25	3.03
Hauling to cannery	15.60	15.60

The individual grower had his trees
wire braced, which eliminated cost
from that angle, and he hauled direct
from orchard to cannery instead of
from orchard to roadside and then
from roadside to cannery.

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by the outside

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years of plowing.

The picture shows the disks pulling
the soil away from the trees, but the
gangs can be reversed to throw it
toward the trees.



Rear view

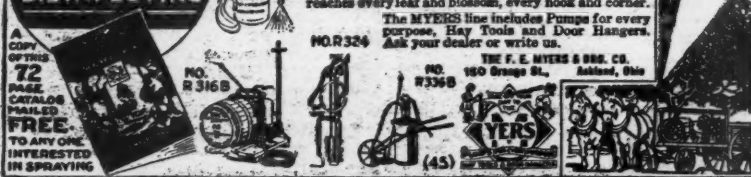
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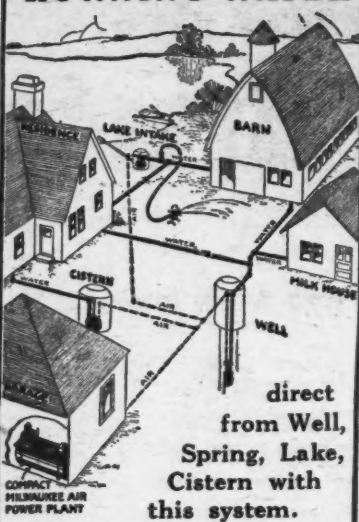
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Summary of Fruit Crop Prospects

(Continued from page 9)

most orchards sufficient live buds to insure a crop. Different varieties have behaved differently in various localities regarding winter killing. Small fruits are in good condition.—*Laurens Greene.*

Illinois (March 17).—In most of the commercial fruit sections, there are sufficient peach buds alive for a good crop. Nearly all buds were killed in some isolated localities. Apple prospects are also good in most places.—*M. J. Dorsey.*

Missouri (March 16).—Fruit prospects generally are very good. The winter has not been cold enough to cause serious injury except to Elberta peaches. The backward weather has kept the buds unusually dormant for this time of the year. Prospects are good for apples, strawberries, grapes, pears and all other fruits except peaches, and with favorable spring weather, there may be enough peach buds left for a good crop.—*T. J. Talbert.*

Kentucky (March 15).—Peach growers in western Kentucky are feeling quite optimistic. There are sufficient buds in the Louisville, Henderson, Paducah and Hopkinsville districts to make a good crop. The buds are swelled, and a few days of warm weather will cause them to open.

Apple prospects are somewhat doubtful owing to extremely dry weather last year. However, many growers are expecting a good crop.—*W. W. Magill.*

Tennessee (March 10).—There has been very little winter damage to peach buds. The buds are now pushing out rapidly. Barring spring frosts, we should have a good peach crop.

Prospects are favorable for a normal early apple crop. The trees are in good condition, and the growers are giving their orchards better care than ever before. Late apples also are in promising condition. What we need now is favorable conditions during and after the blooming period.—*J. A. McClintock.*

Georgia (March 10).—Hiley, Georgia Belle and Hale peaches are now in full bloom. The early varieties which are the last to bloom are just starting to bloom. The Elberta crop will probably be somewhat lighter than a year ago when a heavy crop was produced. The Hiley has a heavy set of buds and the crop of this variety will probably exceed the 1925 crop. The same is true of Georgia Belles and Early Rose. There will probably be no increase in the crops of Carman and Hale. There may be a slight increase in some of the early varieties.

In general, the Georgia peach crop will be larger than last year unless unfavorable conditions are encountered.

Editor's Note.—Press reports received since the above report was made indicate that a recent frost did considerable damage to Georgia peaches.

Texas (March 11).—Texas has had a mild winter. Spring promises to be earlier than usual. Peaches and plums are in full bloom and prospects are for a better crop than last year.

Fig trees on the coast were not injured during the winter. There has been plenty of rain and prospects are good for a heavy crop.

In the lower Rio Grande Valley a January freeze followed by a 30 to 40 mile wind and by rain caused the loss of a large part of the citrus fruit which had not been picked. Some branches were broken by the weight of the ice, but otherwise there was little injury to the trees. The trees are now in full bloom and there are prospects for a good crop.

In general we have the best prospects for a fruit crop all over the state that we have had for years.—*W. B. Lanham.*

Colorado (March 10).—The winter has been unusually mild and fruit prospects are good. The peach crop is particularly promising, and we should have a larger apple crop than last year.

Colorado orchards are in better condition than at any time in the past, since growers are taking greater interest in them and are giving their trees better care than ever before.—*E. P. Sandsten.*

Idaho (March 13).—Conditions were exceptionally favorable for the development of fruit buds last summer. In southern Idaho one of the largest apple crops in history was produced last year; yet a good setting of fruit buds developed because of favorable growing conditions. In the Coeur d'Alene district of north Idaho, where a short crop was produced last year, a good setting of buds also developed. We have had a mild winter and with favorable spring weather we should have a good crop again this year.—*C. C. Vincent.*

Essentials in Strawberry Culture

(Continued from page 9)

others applied this method to other crops and to a large extent, from his work with strawberries, have grown the great industries which depend on refrigeration in transit in order to keep the fruit in good condition during the long journey to market. Directly from this have grown (1) the use of the pony refrigerator in Florida, southern California and other sections in shipping strawberries; (2) the iced carload shipment by means of which the great centers of population are supplied; and (3) the pre-cooling system used especially in California when the days are warm and the berries must be cooled quickly to reach the eastern markets in good condition.

The work of each of these six men was essential to the development of the modern strawberry. The South American Indian made the first selection; Frazier took it to France; Duchesne, in France, discovered the importance of the sex of different varieties; Knight, in England, demonstrated the practicability of crossing to originate new sorts; Longworth rediscovered and made the facts of sex differences common knowledge; and Earle made possible the long distance shipment of the strawberry and the raising of this fruit in the South. From the time of Parker Earle to the present, the story of the strawberry has to do with the origination of varieties superior in some respect to former ones quite largely by breeders with a definite idea in view. Some of these new varieties are adapted to regions where former varieties did not succeed. Thus, the origination of Klondike and Missionary have made possible the development of a great industry in southern states, while the hardy Dunlap variety has extended strawberry growing beyond the northern boundary of the United States. New varieties have recently been originated which make strawberry growing possible even in the interior of Alaska.

The story of the modern strawberry is, of course, interwoven with that of discoveries in other fields and with the growth and development in other fields of agriculture. The discovery of the use of commercial fertilizers in agriculture and of their manufacture was necessary before strawberries could be raised to any extent in Florida and some other regions. Transportation facilities and cheap basket and crate manufacture were also necessary.

Discoveries in systematic botany (the classification and relationship of plants), plant morphology (the structure of plants), plant physiology (the functions of plants), and physics, chemistry, soils, meteorology (the weather), and other sciences, all are valuable aids to the grower if he will but use them. Successful strawberry growing now demands a sound knowledge of many of these botanical principles.

The outstanding developments leading up to the modern strawberry have been briefly sketched this month. Next month we will study the plant itself, beginning with the root and its functions.

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Two Famous Vermont Orchards

By M. B. Cummings
University of Vermont

VERMONT has many large and profitable orchards and is producing much fruit of very fine quality. All may know of the superior quality of Vermont apples, but not many people know of its two famous orchards. One is famous because it grows only Fameuse apples, the finest in all the world; the other will soon be known all over the country because of its immense size. Both are located in western Vermont, not far from the New York line; one in the northwest corner, the other in the southwest corner of the state. One is old enough to be well known, the other so large that it needs to be better known.

Orchard Planted Solidly to Fameuse

This Fameuse orchard of 50 acres was set 33 years ago, and although originally composed of bogus trees of unimproved sorts, it was soon grafted to White Fameuse, often known as "Snow." And, since there are no other varieties in the whole orchard, it is believed to be the only large planting of this variety in the country. This fruit farm grows very fine quality apples of good size, fine color and excellent quality. New York commission men have stated that this variety tops the market in quality. The soil is clay loam, overlaid with open limestone formation. The orchard is on a round hill with trees on all sides of it. The pinnacle in the middle has a small woodlot, where there is a commanding view of the whole orchard and some good Vermont scenery. At blossoming and harvesting time this place is a most charming one.

In the nine years since the present owner, Edmund Seymour, of New York City, has had the orchard, there has not been a crop failure. As evidence of the wisdom of planting Fameuse up there is the fact that 500 trees of the same variety have been set in the last few years. No other variety is to be planted. The orchard will continue to be of only famous Fameuse. The late Hon. J. H. Hale of Connecticut, once extensive grower of apples and peaches, estimated the value of this orchard at \$40,000. A crop one year sold for \$6000 on the trees.

Fameuse Type Planted Widely

Of all the types of apples to be discovered among our American sorts, the Fameuse is the most prominent and persistent. It is known over a large part of the country. The origin of the Fameuse is obscure but interesting as far as it is known. Whether or not it was of European origin is immaterial, but it is agreed that it was distributed by early French missionaries and planted by the earliest settlers in Quebec, Ontario and the northern states. It was first planted in Vermont in 1700 at Chimney Point on Lake Champlain. The early distribution was accomplished by seeds, and this method prevailed for many years in the Province of Ontario. Fameuse is the parent of many other good varieties, such as McIntosh, St. Lawrence, Shawassse, Sweet Fameuse, etc., all of which are very attractive.

"The Orchards"

The other famous Vermont orchard is of much interest because of its immense size. It embraces over 3600 acres of land and has in it 65,000 trees. This farm is known as "The Orchards." It is owned by Edward H. Everett of Bennington, a man who has large commercial interests in New York City. The orchard is planted on the slopes of Mount Anthony, with rows of trees a mile long and extending down all over Carpenter Hill and surrounding the fine summer home of Mr. Everett, which is close by the Bennington Monument in Old Bennington, just over the line from "York State." It is not far from the summer home of Colgate, the soap man, who has orchards of considerable size. The plantings for this large orchard

were begun in 1911 and are still going on. There were plum, pear and cherry trees, as well as apples, in the earlier years. But, as the apple trees need the room, the other kinds of trees are removed, as they were mostly set in to act as filler trees for early crops.

Students Employed in Summer

One of the interesting aspects of orcharding at "The Orchards" is the employment of college students in the summer season. Men from several agricultural colleges have spent their summer there learning and earning, as most young men in colleges need to make progress. The University of Vermont has several demonstration plots in "The Orchards," one of which shows the comparative value of different cover crops that are grown to enrich the soil.

Only the best quality apples are being grown in the Everett orchards, such as McIntosh, Wagener, Northern Spy and Grimes. Experienced men are in charge of these orchards—H. A. Albyn, G. A. Burnap and J. A. McKee—each man having a consigned area for his own supervision. Thousands of barrels are already being produced there, and in a few years the crop can be marketed by trainloads. The small family orchard of northern New England pales in contrast to one of 65,000 trees! If the plantings continue, there will be at blossoming time a mountain of bloom; at harvesting time a mountain of apples!

Codling Moth Eggs Hatch Under Water

CODLING moth eggs will hatch under water, and the larvae will live in water for a time, according to R. E. Smith of the University of California. Prof. Smith was hatching some codling moth eggs in a glass jar. One evening at the close of work he filled the jar with water at 62 degrees Fahrenheit, hoping by this means to check further hatching of the eggs overnight. At nine o'clock the next morning 36 larvae had hatched from about 300 eggs in the jar. The larvae were all alive, clinging to the sides of the jar, and completely submerged in the water. Some had crawled a short distance from the egg cases. The remainder of the eggs hatched normally under observation during the day. The water was syphoned out. The larvae readily attacked an apple which was placed in the jar.

These tests indicate that codling moth can probably hatch and live under conditions of heavy rain and dew. Just how they are able to live under water is not fully understood, since it is known that older larvae when dropped in water die in a few hours. Possibly a slight film of air contained in the eggs adheres to the insects and enables them to live for a time under water.

C. H. HADLEY, Director of the Bureau of Plant Industry of the Pennsylvania Department of Agriculture, states that due to the quarantine measures followed by the department the spread of the Japanese beetle has been confined to small proportions. The spread was less in 1925 than in any year since the insect was introduced. The insect has not migrated any further westward during the past year and but little to the north. The area of infestation has been enlarged by parts of only six townships. The quarantine measures will be vigorously continued during the present year so as to check the spread of the insect.

Teacher—Can you tell me a part of the Bible which forbids a man's having two wives?

Pupil—Yezs'm. "No man can serve two masters."—Brown Jug.

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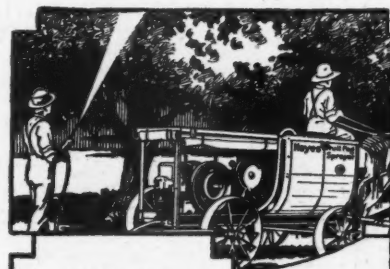
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Entomologists' Report on Oil Emulsions

By J. J. Davis

Purdue University Agricultural Experiment Station

THE AMERICAN Association of Economic Entomologists has recognized the increasing importance of oil emulsions as an orchard spray and has for the past two years endeavored to gather together and summarize the results of tests made throughout America. The committee responsible for the gathering of these data include J. J. Davis, Chairman, of Purdue University; A. J. Ackerman, United States Department of Agriculture, Bentonville, Ark.; W. W. Yothers, United States Department of Agriculture, Orlando, Fla.; and L. Haseman of the University of Missouri.

The second report, just issued, is based on 27 replies received from questionnaires sent to oil emulsion investigators in all sections of the country. There is a rather definite difference in the replies received from the eastern states and from those of the Rocky Mountains and Pacific slope areas. In the East, the original boiled lubricating oil emulsion is recognized as the most generally satisfactory. The reasons for its preference over the cold-mixed emulsions are its more complete emulsification and stability, the fact that the stock emulsions can be prepared days or months in advance, it is apparently more fool-proof, and finally, good stock solutions are now on the market at reasonable costs, and most growers prefer ready prepared emulsions at a slight additional expense rather than bother with the preparation of home-made emulsions.

Calcium Caseinate Emulsifier Preferred

In contrast to the opinion of the majority in the eastern states, the western states show a majority favorable to the cold-mixed emulsions, and of the two or three cold-mixed emulsions referred to, the preference is decidedly for the calcium caseinate emulsifier. The reason underlying the preference for cold-mixed is that there is less difficulty when "hard" or "alkali" waters are used, a problem which cannot be overlooked in many of the western states.

There seems to be little difference in the effectiveness of the boiled and cold-mixed emulsions, but occasionally there is difficulty in making a good cold-mixed emulsion unless the caseinate is quite fresh. The fact that calcium caseinate a year old is often unsuitable for preparing emulsions makes it important that formulas specify fresh material.

Copper Sulphate Emulsifier for Alkali Waters

Because of difficulties with the boiled emulsions where only alkali water is available and difficulties with the cold-mixed when old calcium caseinate is used, several investigators prefer the copper sulphate emulsifier. The formula of this is one gallon of oil, two to four ounces of copper sulphate, two to four ounces of hydrated lime and one-half gallon of water.

The formulas of the two outstanding emulsions as described above are as follows:

Original Boiled Lubricating Oil Emulsion.
Oil 1 gallon
Potash fish oil soap 1 pound
Water 1/2 gallon

Calcium Caseinate Cold-Mixed Oil Emulsion.

Oil 1 gallon
Calcium Caseinate 2 ounces
Water 1/2 gallon

As to the oils which seem to give best results, the following qualifications appear to be sufficient:

Viscosity—90 to 250 seconds at 100 degrees Fahrenheit (Saybolt).
Volatility—Not over 2 per cent.
Specific gravity—0.87 to 0.93 at 20 degrees Centigrade.

The qualities necessary for effectiveness are apparently not definitely recognized, nor is there a satisfactory

understanding of the relative merit of different oils under different climatic conditions and for different insects.

Two to Three Per Cent Emulsion Effective for Dormant Spraying

As to the effectiveness of oils, it is generally agreed that the two or three per cent emulsions are effective against the San Jose scale when applied as a dormant spray. Good control of Putnam, cottony maple, scurfy and European elm scales was reported. Several investigators report fairly good control of the oyster shell scale. A one per cent emulsion is effective against greenhouse scales.

It is generally agreed that the usual dormant oil sprays are ineffective against aphids, but a fairly good control results with the delayed dormant oil emulsion spray. On the other hand, mature aphids have proved rather difficult to destroy in some cases. A one-half to two-thirds per cent oil emulsion with nicotine sulphate at the rate of 1-2000 is an efficient aphid control.

A two to four per cent emulsion is effective against red spider eggs. A one-half to two-thirds per cent emulsion with nicotine sulphate 1-2000 is effective against red spider during the summer.

A one to two per cent emulsion is effective against the nymphs of the red bug.

A six to eight per cent emulsion seems to be generally effective against the eggs of the fruit tree leaf roller. At this strength, however, injury may result if proper precautions are not taken to spray only during favorable weather.

Apparently Ineffective Against Pear Psylla

In New York, oil emulsions seem not to have proven very effective against pear psylla, although the nymphs on hatching usually succumbed to the oil residues of the bark. In Canada, on the other hand, one application of a three per cent oil emulsion applied in early April, after the adults had emerged from their winter quarters, gave very clear-cut results in controlling the psylla.

In general, no injury seems to have resulted from the use of the two to four per cent emulsions when used during the dormant season. Injury on peach resulted when spraying was done during a snowstorm and to apple when sprayed during very cold conditions or when free oil occurred at the end of the tank load.

When oil emulsions are used as summer sprays on deciduous trees, more or less injury results, although in general a two per cent emulsion has given no injury so long as the temperature remained below 100 degrees Fahrenheit. It is generally agreed that at present summer oil sprays should not be recommended for deciduous trees, excepting in special emergency cases.

A 1/2-1/2-50 Bordeaux mixture is desirable as a diluent to aid in preventing oil separation, especially when hard waters are used. When full strength Bordeaux is used with the oil emulsion, there is apparently no appreciable change in the effectiveness of the dormant two or three per cent emulsion. Also Bordeaux is apparently just as effective as a fungicide when used with the oil emulsion as when used alone. More data is needed along this line.

Precautions

The report indicates several suggestions and precautions which growers should keep in mind. Stock solutions should be thoroughly stirred before diluting, if they have stood for several days. The stock oil emulsion should be added to the water or Bordeaux in the tank. Where Bordeaux is used as the diluent, it is especially important that good agitation be maintained.

Nature of Liquid and Dust Spray Materials

DR. H. H. WHETZEL of Cornell University recently gave an address before the Indiana State Horticultural Society in which he presented some fundamental information about the nature of liquid and dust fungicides. This information should be in the hands of every fruit grower, in our opinion, since it will help to create a better understanding of the chemical and physical nature of these materials. Such information will help to clear up much of the misconception that prevails regarding the nature and action of these materials. For this reason we are reproducing in the following paragraphs the part of Dr. Whetzel's talk relating to this matter:

Bordeaux Was Formerly Only Fungicide

"When I went to Cornell the common fungicide was Bordeaux mixture, and it was generally recommended for each and every disease. The theory was that if you told the grower to use Bordeaux mixture he would be able to make it and use it successfully. Now we have the greatest array of fungicides that one can imagine, but after all is said and done there are only two fungicides of any importance: One of them is copper in some form, and the other is sulphur. These are the two fungicides that we have now, and we had them 25 years ago.

"Now, of course, it makes a difference in what form copper and sulphur are when used as protectants. We have them in a great variety of forms. They are all, however, of one of two types—either liquid or dust. As a matter of fact, dusting was the first method of applying fungicides, but when Millardet, in France, discovered Bordeaux mixture about 1883, the spraying period began. From that time on down for a good many years spraying was the almost exclusive method of applying fungicides and insecticides until men began to feel that there was some virtue in the water with which the stuff is put on. I will say to you, as I have often said to my own growers, there is no kick in water. Water is nothing but a carrier for the fungicide, whatever it may be.

"Now, of the liquid forms, Bordeaux on the copper side and lime-sulphur on the other are the two that have had the greatest vogue. Since dust came into our lives we have developed two types of dust. One is sulphur dust, which is merely finely ground sulphur, and the other a copper dust, which is nothing but the ingredients of Bordeaux put together in dry form without the water and dusted on the trees, leaving it to the Lord to supply the water.

"There you have the bare outline of the fungicidal situation.

How a Fungicide Operates

"Now I think it will help a good deal if I try to demonstrate to you the nature of fungicidal action; how a fungicide operates. I doubt whether there are five men in this room that have any good mental picture of how a fungicide actually works to protect the plants they are treating.

"We will imagine, for example, that here is an apple leaf. When you make up Bordeaux mixture you put a solution of copper sulphate and lime water together and what happens? You get a colloidal chemical combination of the copper with the lime water; you don't get a solution. Suppose this is a tumbler or a barrel or vessel, and you put into this some copper sulphate and pour some lime water into it. What you get are little colloidal membranes. You can't see them, but if they were put under the microscope they would look like irregular bits of the white of an egg which had been coagulated in hot water. These colloidal membranes are blue. You know that Bordeaux settles if you let it stand. It is these blue colloidal membranes that settle out. They are neither solids nor liquids, they are between the two, and if you take them out and put a mass of them on your

hand you find they are sticky and gluey like the white of an egg. So you may picture in your mind the Bordeaux mixture as composed of little masses of jelly-like material in which the copper is held in combination in an insoluble form in water.

"Now when you spray Bordeaux onto a leaf you have drops of liquid, in which are several of those little membranes, so when these drops have dried down you have little areas covered with these membranes which stick to the leaf. One of the things that makes Bordeaux mixture a good fungicide is that it is colloidal and sticks to the leaf, and the copper is insoluble in water. Now when a drop of rain falls on this leaf after the Bordeaux has dried, and an apple scab spore falls into it, what happens? Let us cut a section through this leaf and look at it sideways.

Spores Absorb Poison and Cause Own Death

"Here is the Bordeaux mixture, here is the drop of water, and down under here the cells of the leaf. This apple scab spore falls in this drop of water. How is it prevented from getting into this leaf? By the copper? But the copper is insoluble in water. If the copper in those membranes were not insoluble in rain water, it would be washed off very quickly, but it does not wash away. A full grown apple leaf sprayed with Bordeaux mixture is protected for the rest of the season.

"As soon as the spore starts to germinate, it gives off into the water secretions of some kind. Some of those secretions are in the nature of acids which dissolve a little of the copper out of these membranes. Pretty soon there is soluble copper around this spore, which is toxic to the spore; that is to say, it diffuses into the spore and kills it. The spore itself brings about its death by first dissolving and then absorbing some of the copper. In other words, the spore commits suicide.

"That is the fundamental principle of fungicidal action. It doesn't make any difference whether you use Bordeaux mixture or fine particles of sulphur which are also insoluble in water. Suppose you have sprayed this leaf with lime-sulphur, what has happened? The lime-sulphur solution doesn't have colloidal membranes. It has sulphur in solution. When you spray it onto the leaf, you have drops of soluble lime sulphides. But as soon as it dries and the air begins to act on it, it is quickly changed into insoluble sulphur, so that in a very short time these spots are covered with particles of very fine sulphur precipitated out. So on a leaf sprayed with lime-sulphur you have little areas covered with finely divided sulphur, commonly spoken of as precipitated sulphur. They are fine and they stick to the leaf, and don't wash off, merely because they are fine.

Fine Particles Adhere to Smooth Surfaces

"Every one of you has had an experience which shows you that if particles of dust are fine enough they will stick to a smooth surface. You all drive automobiles (at least you look as if you do; some of you may drive Fords). You have washed and shined them up and have then driven them on a dusty day. All you have to do to get them nice and shiny again is to turn the hose on them, isn't it? No, you have to get out the sponge and scrub them. Is that all you have to do? No, you have to get out the chamols and polish them and when you are through the chamols is black. Why? Because the fine particles of road dust stuck in spite of hose and sponge. No man ever expected that washing his car by standing it out in the rain will give it a shine. Some fellows wash them that way, but they don't shine.

"Now that is what makes these fine particles of sulphur stick to the leaf. That is why they do not wash off. The particles are not gluey like the Bor-

deaux mixture, but they are so fine that the attraction of the leaf surface for the particles is greater than the power of the falling rain drops to splash them off.

"The spore acts on sulphur in the same way that it does on the Bordeaux membranes. When it falls into a drop of rain water on a leaf which had been sprayed with lime-sulphur, the spore secretes substances which dissolve some of the sulphur, which it then absorbs. The spore kills itself. We will now notice some of the features of a good fungicide. It has to be insoluble in water so it doesn't wash off in the rain. It has to stick because it is gluey or fine. There you have our two fungicides, one sticks because it is gluey, and the other because it is fine.

Types of Dust

"I want to say something about new types of dust. Up to the present time we have had for use in dust form, on the sulphur side, finely ground sulphur made by grinding crude sulphur into a very fine state of division. The standard up to this year at least has commonly been a sulphur, 95 or 96 per cent of which would pass through a 200-mesh screen, and I will take any standard sulphur dust that you will furnish that will meet that test and deliver you 90 to 95 per cent clean apples in any season. Of course, these men that sell it claim they have sulphur that is better than that standard stuff—and maybe they have, I don't know—but taking it by and large, the fellow that will sell you standard sulphur at the lowest price is the fellow to buy it from, generally speaking.

"In other words, finely ground sulphur as it is on the market today is fairly well standardized. We have carried on some experiments on this matter of the fineness of sulphur and its sticking qualities or adhesiveness during the last four or five years. We have found that if you spray the leaves with lime-sulphur and dust others with sulphur you will have for the first 10 days more sulphur on the dusted leaves than on the sprayed leaves, even though you have frequent rains, but after the first 10 days, that is, during the second 10 days, you will have just as much sulphur on the sprayed as you do on the dusted. In other words, more sulphur washes off the dusted leaf during the first 10 days than from the sprayed.

Loose Dust Is Not Effective

"Now the dust that comes off in these rains is not effective sulphur anyhow. It is too coarse. It is only the finely divided particles of sulphur that stick through the entire 20 days that are effective. We found at the end of 20 or 21 days that the leaf had enough sulphur, whether it was dusted or sprayed, to be protected.

"I said there is enough of the very fine sulphur in the ordinary standard sulphur dust to give protection, so what we did was to take inert filler and add to it precipitated sulphur, which is just as fine as this fine material in standard dust. We added 20 pounds to the 80 pounds of inert filler and dusted the trees with it. This gave us good control of scab as standard dusting sulphur. In other words, there is in ordinary standard dusting sulphur about 20 pounds that is as fine as the sulphur you get from lime-sulphur. That is the reason you get approximately the same control. Now neither lime-sulphur nor sulphur dust are ideal fungicides, for several reasons.

"The reason Bordeaux is such an ideal fungicide is because of its colloidal character, which makes it stick better than even fine particles do. So an effort has been made among fungicide men to discover a colloidal sulphur. A lot of investigation has been going on, and it was found that you can make colloidal sulphur in suspension in water that is far more efficient than finely ground sulphur, because the sulphur is so much finer and because it is colloidal and will stick. But no satisfactory powdered form of

colloidal sulphur has appeared until very recently.

A True Colloidal Sulphur

"About a year ago I came across a sulphur dust which is true colloidal sulphur. When you drop a bit of ground sulphur into water you know what it will do; it will ride on the surface. When you drop this new colloidal sulphur in water it will go into suspension at once. It won't settle, but will give you a suspension that will stand up for months, a true colloidal suspension. This colloidal sulphur in laboratory tests (it hasn't been tested in the fields to any great extent yet) shows extraordinary fungicidal properties. We test it this way: We take a glass slide and dust it with the material we want to test; we use the slide as if it were a leaf. The spores are put into suspension in water, and a drop of water with the spores in it is placed on the dusted slide. We carry our checks on slides that are not dusted. Both are set away to let the spores germinate. Using this test, we found if we took one-third of one per cent of this colloidal sulphur diluted in an inert carrier and dusted it on that slide and dusted the other slide with full strength dusting sulphur that this one-third of one per cent would do exactly what ordinary dusting sulphur would do. It was 300 times as effective.

"If this sulphur has the other characteristics which it promises to have when it is put on the trees, it looks as though it would be very much more effective than lime-sulphur or any dusting sulphur we have ever had before, because it is much finer. It is colloidal. It sticks. You can dust the slide and put it under the tap or turn the hose on it, when it is dry the sulphur is still there. So I think we are due in the next two or three years for a tremendous development in new dusts. I have on my desk now four or five colloidal copper dusts that will go into colloidal suspension just as this colloidal sulphur will. They are finer than any Bordeaux mixture you can make. A lot of things will have to be found out about them. I haven't tested them extensively as to their fungicidal efficiencies. As far as I have tested, they are as effective as Bordeaux. We have yet to test the injury they may do to plants. Perhaps they will burn the plants. That has to be found out.

New Dusts in Prospect

"We are due to have some new sulphur and copper dusts that are much better than anything we have had. It will take time to test them out. They are exceedingly promising, and from what we know of the fundamental requirements of fungicides, they look good.

"Then there is a whole field of other substances outside of copper and sulphur which are now being investigated, and 10 years from now we may have not alone sulphur and copper as fungicides but a lot of other materials, possibly nickel, aluminum—nobody knows much about the other metals, what they will do when put up in colloidal form."

ABOUT 27,000 acres of citrus fruit trees in Florida have been cut up for subdivision purposes, is the estimate of Frank Kay Anderson of Orlando, Fla. Coincident with this estimate is one made by Frank Skelly of the American Fruit Growers, who arrived at practically the same figure.

Figuring 69 trees to the acre, this would mean that approximately 1,850,000 trees have been sacrificed to the development of home sites. These trees would probably average three boxes per tree, which would mean around 5,000,000 boxes per year.

While many groves have been sold for subdivision purposes, not all of them have been totally destroyed, and in the majority of cases trees have been left on the lots as additional attraction to the home seeker.

—Seald-Sweet Chronicle



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